

VOLUME 1 NUMBER 7 JULY 1994

OS/2

M A G A Z I N E

Test Drives

QuikSwitch:
Hot-Keys Made Easy

AMOS: Read HPFS
From DOS

Secret Tools

Enhanced Editor
PM Terminal
CID Installations

Tuning NetWare

With *lansup.sys*

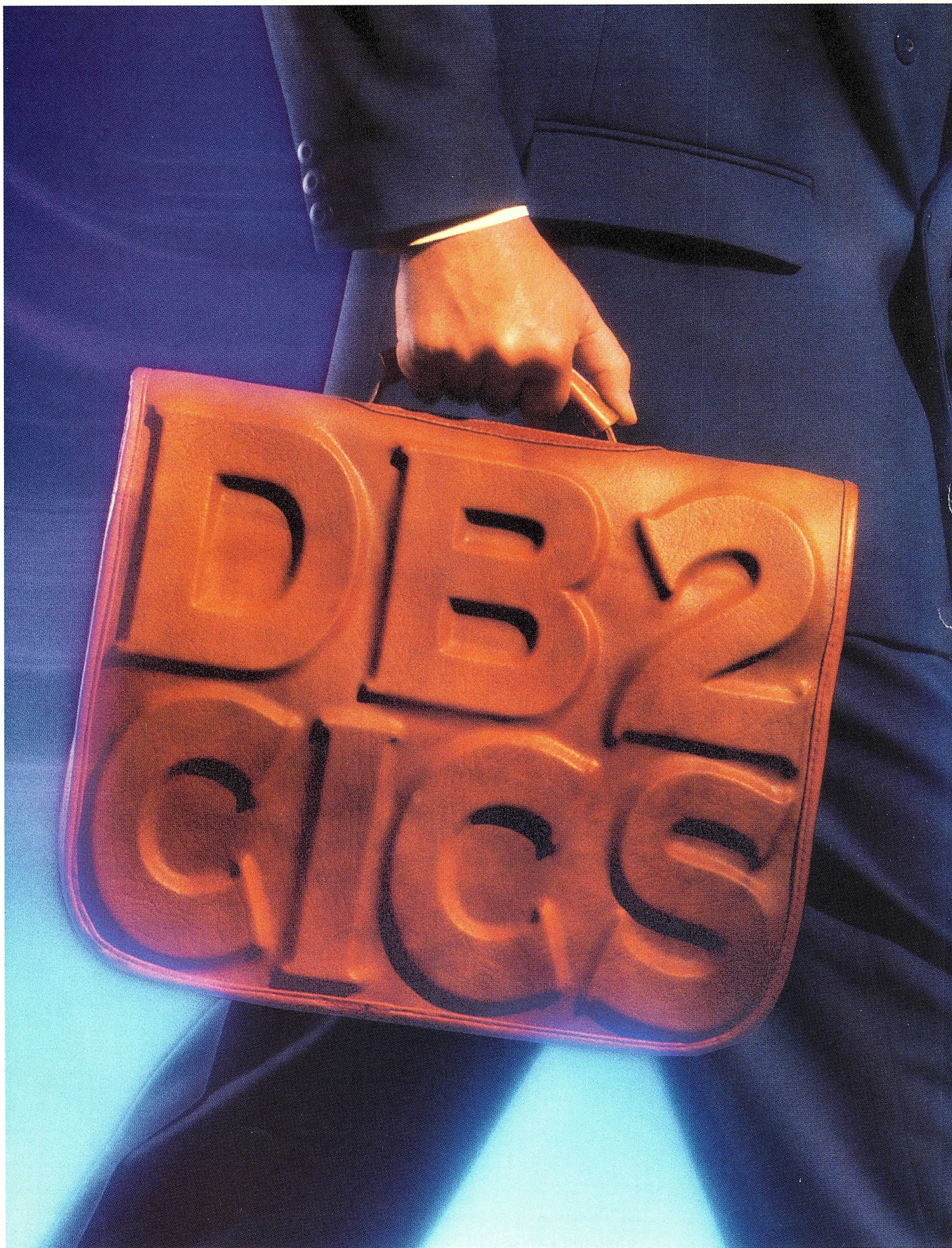
The Big Picture
REXX Programming
Under the Hood
Tips & Tricks

\$3.95 US/\$4.95 Canada

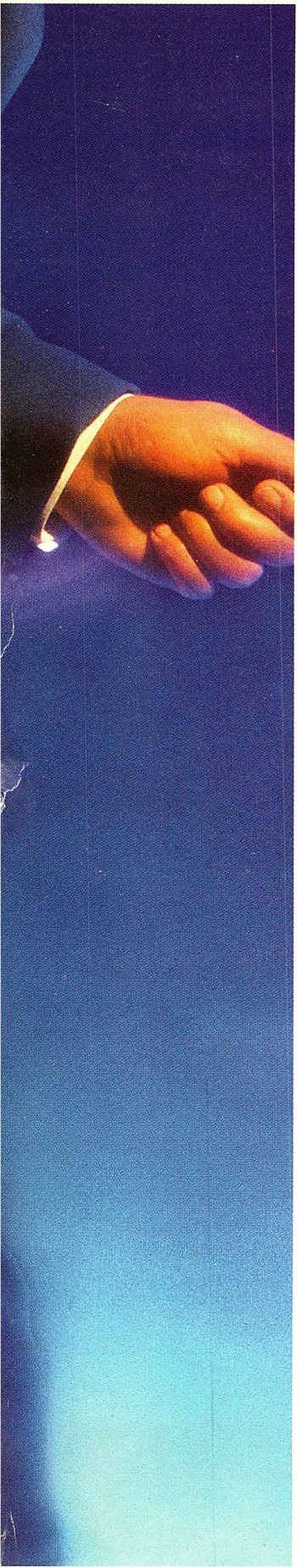


A Miller Freeman Publication





IBM, DB2, DB2/2, CICS OS/2 and AS/400 are trademarks and registered trademarks of International Business Machines Corporation.
UNIX is a registered trademark of UNIX Systems Laboratories, Inc.
©1994 IBM Corp.



MOVING TO CLIENT/SERVER: THE ADVANTAGE OF BRINGING YOUR TOOLS WITH YOU.

DB2/2™ and CICS OS/2™ bring familiarity and reliability to the PC LAN environment.

Now you can extend your most critical applications to a multi-platform environment with confidence. With DB2/2 and CICS OS/2 you can protect your investment in existing applications, development skills, and host data.

The DB2/2 Advantage

DB2/2 provides high performance, availability and functionality, so you can run complex, mission-critical applications. Plus, it has the recovery features you've come to expect from DB2.

The CICS OS/2 Advantage

CICS OS/2 delivers end-to-end integrity, ensuring that transactions are completed successfully. It can also help you manage a Client/Server environment by

coordinating resources, both inside and outside the LAN.

The IBM Advantage

Take your existing DB2 and CICS applications to a PC LAN environment with minimal effort. Applications developed using DB2/2 and CICS OS/2 can be extended to a growing list of environments,

including UNIX®, AS/400™ and your IBM mainframe, as needs demand. So you can run your applications wherever it makes sense to improve data

DB2/2 and CICS OS/2	
End-to-end transaction integrity.	✓
Data recoverability/integrity.	✓
High availability.	✓
Support GUI interfaces.	✓
Familiar tools for database management and application development.	✓
Single contact for support for both database and transaction manager.	✓

access and system performance.

And if you ever need assistance, you get it quickly and directly from one knowledgeable source.

Until July 29th, 1994 you can also take advantage of some very attractive prices on DB2/2 and CICS OS/2.

To order or receive additional information, please telephone 1-800-IBM-CALL, dept. 149L in the U.S. or 1-800-465-7999 dept. 698 in Canada. Or contact your local IBM representative.



Now that you are running a 32-bit,
protected mode, preemptive multi-tasking,
segmented virtual memory operating system...



**Don't You Want To See
What's Under The Hood?**

Introducing **Pegasus** **Resource Monitor™**

for OS/2 version 2.x. The first affordable, **professional**
performance monitor for OS/2 desktops and servers.

Confused about how to reap the full benefits from the powerful performance features of OS/2? Are you tired of tinkering with options without being able to measure what they do? Have you tried other performance monitor products and been less than satisfied with the results?

Pegasus unlocks the secrets of OS/2 so that you can drive your system harder and faster. Pegasus reaches into the OS/2 kernel to grab accurate statistics on CPU, memory and disk performance. Other OS/2 monitors saturate system resources. Pegasus keeps track of all OS/2 foreground and background activity, including DOS

and Windows apps, and does it with low overhead.

Pegasus lets you see inside OS/2 in real time or access comprehensive performance statistics using the Pegasus REXX extensions for analysis after the fact. Exceptions also pop up to alert you automatically when problems are occurring. Or Pegasus can display a concise graphical view of system performance on your desktop at all times.

For a limited time only, Pegasus Resource Monitor for OS/2 is just \$99. Competitive upgrade only \$69.

Introductory price \$99

Competitive upgrade \$69

Pegasus Resource Monitor is a trademark of C.O.L. Systems, Inc. All other company, product and brand names are trademarks or registered trademarks of their respective holders.

TOLL FREE 1-800-OS2-OS2-9 (672-6729)

FAX 813-261-6549

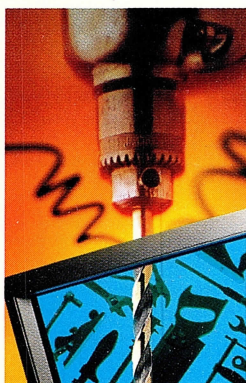
ONDEMAND Software & Services, Inc.

Reader Service No. 2

Table of Contents

Volume One Number Seven
July 1994

OS/2
M A G A Z I N E



Cover Story

22 A Secret Guide to the Enhanced Editor

Included with every copy of OS/2 2.x is EPM, the Enhanced Editor. It's more than a tool for editing your *config.sys*, however: EPM is a mature and powerful text editor with its own programming language, the ability to edit multiple files, and much more. Here's what you'll need to know to take advantage of EPM's capabilities.

By Steve Gallagher

Features

30 Driver Downloads Made Simple

You're ready to install a new piece of equipment, and the instructions say to download the OS/2 drivers from CompuServe or from the vendor's own bulletin-board system. What do you do? If you have access to a modem, and if you've installed PM Terminal, we'll walk you through the process. By Esther Schindler

39 Making it Up in Volume

Twenty-five disks to install OS/2 2.1. Eight disks for communications services, three for network support, and then you'll need to install applications. Forget about floppies: If you're installing or upgrading dozens of OS/2 systems, automate the task with configuration, installation, and distribution (CID) utilities. By Rob Coventry

46 Tuning NetWare, Part III

Are your NetWare clients interfacing with IBM's Extended Services? We conclude our NetWare tuning series by discussing ways to optimize NetWare using Novell's *lansup.sys* driver. We'll also look at IBM's *odi2ndi.sys* driver, which offers closer IBM-to-Novell interoperability. By Bob Panza

Departments

7 Perspectives

Our question is, who wins and who loses if IBM offers a lower-functionality version of OS/2?

11 Letters

The future of WordPerfect, and *config.sys* mysteries solved.

13 Dateline: OS/2

New Mwave drivers help out digital-signal processors, and the marriage between OS/2 and Novell's Requester.

55 Just Announced

The latest news about OS/2 hardware and software.

Reviews

53 Voodoo Secrets

Two books for you to peruse: *Voodoo OS/2* is aimed at the new OS/2 user, and *OS/2 Secrets and Solutions* is designed as a long-term reference tool.

By Charles Bermant

Columns

15 The Big Picture

Amy Wohl explores the history of office automation, from its origins in the 1960s to today—but concludes that the term still describes the goals of modern business computing.

19 Test Drives

Read what Brian Proffit thinks about QwikSwitch, a hot-key utility that activates as many as 72 programs, and AMOS, a tool that gives DOS programs limited access to HPFS partitions.

59 The REXX Column

With Alex Lane's help, we'll build a file-searching utility that uses *rexxutil.dll*'s more than two dozen extra functions to look inside text documents for a desired text string.

62 Information Center

If you're interested in learning more about OS/2—or in setting up formal instruction for your colleagues or customers—check out Dick Conklin's list of OS/2 higher-education resources.

72 Under the Hood

An expert tour of *config.sys*'s *device*, *basedev*, and *ifs* commands is happening this month, courtesy of Mark Minasi, our friendly native guide.

78 Tips & Tricks

Confused about PCMCIA? David Reich explains how OS/2 supports these tiny expansion cards, as well as converting *.inf* files to text, using extended attributes, and more.

Editor-in-Chief

ALAN ZEICHICK

Managing Editor

GEORGE WALSH

Technical Editor

GUY WRIGHT

Assistant Editor

ALEXANDER ANTONIADES

Editorial Assistant

ANNE MELLINGER

Art Director

EARL G. FLEWELLEN

Contributing Editors

DICK CONKLIN

ALEX LANE

MARK MINASI

DAVID MOSKOWITZ

BRIAN PROFFIT

DAVID REICH

ESTHER SCHINDLER

AMY WOHL

Publisher

TED BAHR

East/Midwest Sales

Manager

JAMES KAVETAS (212) 626-2546

East/Midwest Sales

LISA KRAUS (212) 626-2448

Western Sales Manager

CATHERINE MCCONVILLE

(415) 905-8115

Western Sales

MOLLY KNOX (415) 905-8126

Advertising Production

Coordinator

JON SHURKIN

Marketing Manager

HEATHER CHAN

Circulation Manager

SARA DECARLO

Newsstand Manager

PAM SANTORO

Subscription Questions

(800) 765-1291

Reprints

ANDREA VARNI (415) 905-2552

Postmaster

SEND ADDRESS CHANGES TO: OS/2
MAGAZINE, CIRCULATION DEPARTMENT,
PO Box 56664, BOULDER, CO 80323-
6664. TELEPHONE (800) 765-1291.



Chairman of the Board

GRAHAM J.S. WILSON

President/CEO

MARSHALL W. FREEMAN

Executive Vice President

THOMAS L. KEMP

Senior Vice Presidents

H. VERNE PACKER

DONALD A. PAZOUR

WINI D. RAGUS

Vice President/CFO

WARREN A. AMBROSE

Vice

President/Administration

CHARLES H. BENZ,

Vice President/Production

ANDREW A. MICKUS

Vice President/Circulation

JERRY OKABE

Vice President

Electronics/Design Unit

TED BAHR

Postal and Rates

SECOND-CLASS POSTAGE IS PAID AT SAN FRANCISCO, CA, AND ADDITIONAL MAILING OFFICES. OS/2 MAGAZINE (ISSN #1073-1547) IS PUBLISHED MONTHLY BY MILLER FREEMAN INC., 600 HARRISON ST., SAN FRANCISCO, CA 94107. DOMESTIC SUBSCRIPTION RATE FOR ONE YEAR IS \$39.95; TWO YEARS, \$64.95. CANADA RATES FOR ONE YEAR ARE \$49.95; TWO YEARS, \$74.95 (PAYABLE IN U.S. FUNDS). FOR ALL OTHER COUNTRIES, THE RATE FOR ONE YEAR IS \$79.95 AIRMAIL (PREPAYMENT IN U.S. FUNDS). SINGLE-COPY PRICE (U.S.) IS \$3.95 PLUS \$2.00 POSTAGE; INTERNATIONAL, \$8.75 INCLUDING POSTAGE. ALL MATERIAL COPYRIGHT©1994 BY MILLER FREEMAN INC.

ALL RIGHTS RESERVED.

PRINTED IN THE U.S.A.

EDITORIAL POLICY: OS/2 MAGAZINE IS AN INDEPENDENT PUBLICATION WITHOUT OBLIGATION TO ANY HARDWARE OR SOFTWARE VENDOR, DEALER, OR DISTRIBUTOR. SEND EDITORIAL QUERIES TO OS/2 MAGAZINE, EDITORIAL DEPARTMENT, 600 HARRISON ST., SAN FRANCISCO, CA 94107.

ABC MEMBERSHIP APPLIED FOR
OCTOBER 1993

Reaching the OS/2 Magazine Editors

THE EDITORS OF OS/2 MAGAZINE ARE ALWAYS INTERESTED IN YOUR QUESTIONS AND SUGGESTIONS, PRAISE OR CRITICISM. OUR MAILING ADDRESS IS EDITORIAL DEPARTMENT, OS/2 MAGAZINE, 600 HARRISON ST., SAN FRANCISCO, CA 94107. OUR MAIN SWITCHBOARD IS AT (415) 905-2200, AND THE OS/2 MAGAZINE FAX NUMBER IS (415) 905-2499.

Electronic Mail

MANY OF THE OS/2 MAGAZINE EDITORS AND CONTRIBUTING EDITORS MAINTAIN ELECTRONIC MAILBOXES ON COMPUSEVE OR THROUGH THE INTERNET:

ALAN ZEICHICK	76703,756
OR	ZEICHICK@ACM.ORG
ALEXANDER ANTONIADES	71154,676
DICK CONKLIN	76711,1005
OR	OS2MAG@VNET.IBM.COM
ALEX LANE	75715,1370
DAVID MOSKOWITZ	76701,100
BRIAN PROFFIT	75300,1466
DAVID REICH	76711,632
MATT TRASK	MATT.TRASK@BIX.COM
CUSTOMER SERVICE	71572,341

COMPUSEVE MAILBOXES CAN ALSO BE REACHED THROUGH OTHER ELECTRONIC SERVICES. FOR EXAMPLE, THE FORMAT IS 76703.756@COMPUSEVE.COM FROM THE INTERNET.

CompuServe

OS/2 MAGAZINE EDITORS CAN BE REACHED ON THE OS2AVEN FORUM ON COMPUSEVE. IF YOU'RE NOT FREQUENTING THE VARIOUS OS/2-RELATED COMPUSEVE FORUMS, YOU'RE MISSING A USER FORUM OR OS/2 MAGAZINE READERS, WRITERS, EDITORS, AND THE ENTIRE OS/2 COMMUNITY TO GATHER ELECTRONICALLY. IF YOU'RE A COMPUSEVE MEMBER, YOU CAN VISIT THE FORUM BY TYPING GO OS2AVEN AT THE COMMAND PROMPT. YOU'LL BE GIVEN THE OPPORTUNITY TO JOIN THE FORUM. GO AHEAD—THERE'S NO CHARGE BEYOND NORMAL COMPUSEVE RATES. TO LEAVE FEEDBACK FOR OS/2 MAGAZINE EDITORS, TYPE GO MAIL AND SEND ELECTRONIC MAIL TO THE ADDRESSES LISTED ABOVE. DON'T BE PASSIVE! YOU CAN CONTRIBUTE TO THE SUCCESS OF THE OS/2 FORUMS BY WRITING AND LEAVING MESSAGES AND ADDING YOUR OWN PROGRAMS AND FILES TO ITS PUBLIC-DOMAIN AND SHAREWARE LIBRARIES. IF YOU'RE NOT A COMPUSEVE MEMBER, HERE'S HOW TO JOIN:

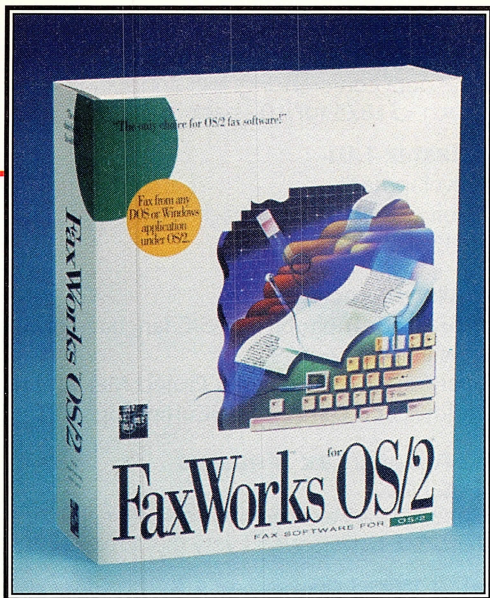
■ SET YOUR COMMUNICATIONS SOFTWARE FOR 300, 1200, 2400, OR 9600 BITS PER SECOND (BPS), 7 DATA BITS, EVEN PARITY, 1 STOP BIT, AND FULL DUPLEX.

■ TO FIND THE NUMBER NEAREST YOU, DIAL 800-346-3247 WITH YOUR MODEM (IN CANADA, DIAL 800-635-6225, VOICE ONLY). WHEN THE MODEM CONNECTS, PRESS ENTER. AT THE HOST NAME PROMPT, ENTER PHONES. FOLLOW THE MENUS AND NOTE THE NUMBER CLOSEST TO YOU. THEN HANG UP AND DIAL THE NUMBER YOU HAVE JUST FOUND.

■ ONCE YOU'RE CONNECTED, PRESS CTRL-C. THEN ENTER THE FOLLOWING INFORMATION AT THE PROMPTS:

HOST NAME:	CIS
USER ID:	177000,5605
PASSWORD:	COMPUSEVE
AGREEMENT #:	CADENCE
SERIAL #:	93015

AFTER ENTERING YOUR BILLING INFORMATION, TYPE GO IBMOS2 FOR A MENU OF THE VARIOUS OS/2-RELATED FORUMS. NOTE THAT COMPUSEVE BILLS A MONTHLY FEE PLUS HOURLY CONNECT-TIME CHARGES.



FaxWorks™

The best



fax solution

Introducing FaxWorks™ for OS/2

It works while you're in other applications. It works when you're not at your PC. It works from OS/2®, Windows™ or DOS applications. It works with ATM and TrueType fonts that come with OS/2. FaxWorks for OS/2 was born and bred for the Workplace Shell™, so it works in ways fax software created for lesser operating systems simply can't.

Efficient Faxing Is All In A Day's Work

FaxWorks' powerful features give you unmatched "paperless fax" capabilities. Create custom cover sheets with graphics and logos. Send faxes from applications running under OS/2 or directly from the Workplace Shell. FaxWorks alerts you when a fax arrives. Then you can easily view, save and print your faxes. With annotation tools for cutting, pasting, freehand graphics and text insertion, you can even mark up and edit faxes right on your screen and fax them out again.

FaxWorks Does It All

FaxWorks for OS/2 is available for single and multi-user environments, with support for AS/400 and mainframe faxing. Additional modules include support for OCR, PCL, DOS/Windows clients and multi-channel fax boards. To order or to find out more about the FaxWorks family of products including DOS, Windows and LAN versions, call 1-800-FaxWorks.



* Tested, warranted and supported by manufacturer to ThinkPad Compatibility Standards.

SOFTNET
The Standard in Fax Software

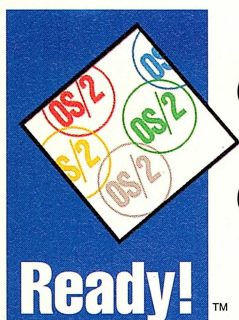
1-800-FaxWorks

1110 Northchase Pkwy, Suite 150 / Atlanta, Georgia 30067
(404) 984-8088 Fax (404) 984-9956

FaxWorks is a trademark of SoftNet, Inc. Developed by Keller Group, Inc. OS/2 is a registered trademark of International Business Machines, Inc.. Windows is a trademark of Microsoft Corporation. All other referenced products are trademarks or registered trademarks of their respective manufacturers.



OS/2 Goes Retail...



for OS/2

PROVANTAGE

1-800-336-1166

EGGHEAD SOFTWARE
North America's Software Eggsperts.

1-800-EGGHEAD

MicroWAREHOUSE

1-800-367-7080

COMPUSA

THE COMPUTER SUPERSTORE..

1-800-COMPUSA

The Corner Store

1-800-I-BUY-OS2

MICRO CENTER

THE COMPUTER DEPARTMENT STORE*

OS/2 EXPRESS

**INDELIBLE
BLUE**
Inc.

1-800-776-8284

Great prices.

Great selection.



Plain Wrap Prices,
Black Tie Service.
800-274-6611

Person to Person/2

IBM Corporation
Real time data conferencing and annotation
\$288 Each - \$1875 for 10 - pack

BackMaster 1.01

MSR Development
The 32-bit QIC 40/80 tape backup utility for
OS/2 2.1. \$79.95

Computer Associates

CA-Realizer 2.0-The robust BASIC language now for
Windows and OS/2. \$99
CA-Superproject 3.0-Powerful Project Manager now
for Windows and OS/2. \$149(Comp Upgrade)

PCMCIA Data/Fax Modems

Apex Data, Inc.
High Speed Data/Fax Modems - cellular capable and
includes OS/2 Drivers with every modem. \$329

DeScribe Word Processor 4.0

DeScribe, Inc.
First & best 32-bit Graphical OS/2 Word Processor.
\$495, \$139 (Comp Upgrade)

MEDIAscript OS/2 Special Edition

Network Technology Corporation
Powerful multimedia tools which support PM windows
and controls, and MMPM/2 digital audio, video, and
animation. \$395

SkyScraper™ DESKTOP MANAGER FOR OS/2

by Binar Graphic, Inc.
SkyScraper lets you run all your applications full-screen
at the same time, each one on its own virtual "desk" on
the SkyScraper toolbar, and switch between them
instantly with a single mouse click. You can launch
applications by dragging and dropping them on the
SkyScraper toolbar, and even launch DOS and OS/2
text mode sessions! \$99.95

Hilgraeve

HyperACCESS/5
Award-winning communication software for file trans-
fer, term emulation, and remote control. \$199
KopyKat - Fast reliable graphical remote control software
for OS/2. Support LANs and Modems.
List Price \$199 (includes two licenses)

LinkRight

Rightware
Parallel port and serial port file transfer utility made
especially for OS/2. \$119 Upgrade, \$189 Full

Lotus SmartSuite for OS/2

Lotus Development Corporation
The only complete solution for OS/2 desktops.
SRP-\$595 Upgrade, \$795 Full

Performance 2.1 PLUS

Clear & Simple, Inc.
New Release! A Tuning & Utility Kit; book + 40 Rexx
programs, bonus 3000 OS/2 Icons. \$39.95

Power Translator Professional for OS/2

Globalink, Inc.
Translates Spanish, French or German text files
to/from English with a 90% accuracy. \$1195

Reader Service No. 4

Prices shown are manufacturer list prices, specials and discounts may be available. All products may not be in stock at all stores, be sure to ask for availability. Sponsored by the OS/2 Vendor Council-Dealers, Retailers, Mail Order Inquiries Welcome. Call (203) 658-1204.

Perspectives

United We Stand, Divided We Fall

OS/2's success is due to its strength as the most powerful, benefit-laden operating system available. In the future, it must continue evolving as a no-holds-barred high-performance 32-bit operating system, and yet become even more accessible to everybody with at least a minimal hardware base. I tried to explain that viewpoint in my May *Perspectives*, ("Who Needs OS/2, Anyway?," p. 7) but unfortunately, some readers thought I was saying that OS/2 isn't good for individuals, that a 4MB RAM version of OS/2 is undesirable, and that *OS/2 Magazine* doesn't care about individual OS/2 users. So, to set the record straight:

OS/2 is an excellent operating system for most PC users. OS/2's hardware requirements aren't much greater, in many cases, than the average new PC configuration being sold through retail stores or mail-order distributors. Many end-users who push the limits of older operating systems can take advantage of all those big and little things that make OS/2 and the Workplace Shell such a pleasure to use.

My point? IBM should focus on making OS/2 more accessible to consumers by addressing consumer concerns, rather than by coming up with vague new marketing slogans. The best marketing tool for OS/2 will be a better, cleaner, and safer installation procedure. Let's get more third-party device drivers out there, especially for those older video boards, CD-ROM drives, and other peripherals that many DOS and Windows users already own and can't justify replacing. And maybe a little more visible success at encouraging systems builders to pre-load and *promote* pre-loading

**IBM should focus
on making OS/2 more
accessible to consumers by
addressing consumer
concerns, rather than by
coming up with vague new
marketing slogans.**

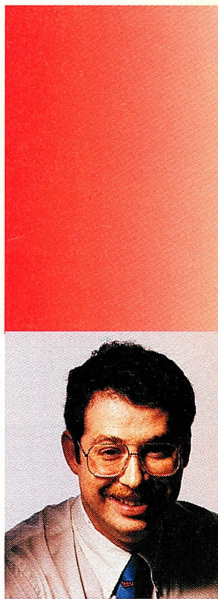
OS/2 will go a long way to easing some consumers' misgivings.

A 4MB RAM version of OS/2 would not only be great, but is long overdue. In May, I said that IBM shouldn't develop an "OS/2 Lite," which I mentally defined as a version of OS/2 with less functionality than OS/2 2.1. Alas, many of you, thought I was saying that a 4MB RAM version was unnecessary. That's not what I meant.

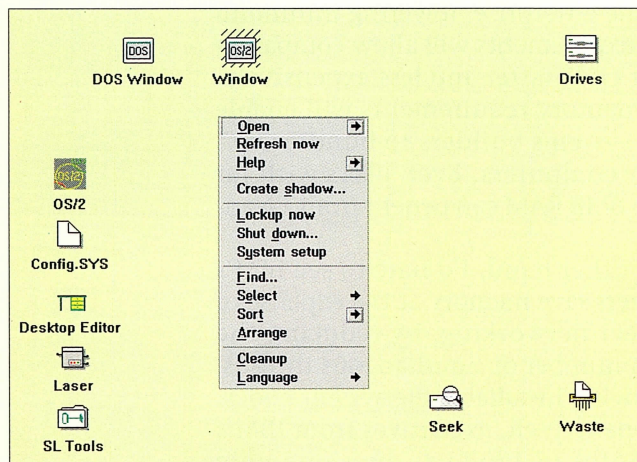
I'm as anxious as you are to see the full OS/2 2.x

become more memory-efficient, as long as there's no accompanying sacrifice of functionality. Memory is expensive, and not every potential OS/2 user can afford to add more RAM. In the enterprise, lowering minimum hardware requirements will allow companies to roll out OS/2 faster and less expensively. Lowered memory requirements will enable many PC systems builders to bundle OS/2 with their computers. Even users with far more than 8MB RAM can benefit from a leaner OS/2.

On the other hand, I'd hate to see IBM's programmers save memory at the expense of peer-to-peer networking, by reducing the maximum number of simultaneous threads, or by removing installable file-system hooks. Can't happen? Well, executives from IBM's Personal Software Products division imply that we'll soon see several parallel versions of OS/2, with at least two different OS/2 kernels. There's the "small office/home office/game player" OS/2 that offers a one-button install program and runs in 4MB RAM but has reduced performance. A fully featured version should replace OS/2 2.1; I've heard conflicting



Standard Smart-Lock utilizes a chip-card for every user to store user profile data securely. Smart-Lock *lite* provides nearly the same functionality without chipcards but based on userID/password identification at a very attractive cost level.



- User specific, dynamic adjustment of
 - WPS configuration
 - Pop-up menu content
 - available applications
 - diskette usage
 - user data folder
- easy to use administrator tools for LAN and host environment
- SOM-based user profile management
- Client/Server LAN version based on DSOM technique
- Single Logon to Host, LAN and other applications
- multi country NLS support
- “future proof” OS/2 integration
- multithreaded 32-bit code
- user specific definable workstation access times
- Upward compatible to chip card based Smart-Lock



For networks use the Client/Server-version, which can be centrally administered and provides the same appearance to each user on all workstations in the network.

.....	Dual-User	US \$	99,-*)
.....	Multi-User	US \$	149,-*)
.....	Client/Server 10 User	US \$	999,-*)

☐ cheque enclosed ☐ VISA ☐ Master Card

(card number) _____ / _____
(expiry date)

signature

*) add \$ 10 for handling & shipping. Price valid for orders through Sept 30th.

P.O. Box 7251
WILTON, Ct. 06897

Smart-Lock is a registered trade mark of Corporate Info Management GmbH

reports as to whether this version will run in 4MB RAM. Then, there's the version that supports symmetric multiprocessing (SMP). And maybe even more specialized versions are forthcoming.

This approach is bad for several reasons. First, a proliferation of OS/2 versions will confuse OS/2 buyers, dealers, and developers, provide fuel to its detractors, and possibly slow OS/2's momentum. Second, many developers will design their products to support the lowest-common-denominator version—and that means that the more advanced operating systems (the ones millions of buyers have embraced as full-featured OS/2 2.x) might wither on the vine. Third, everyone will have to deal with inevitable incompatibilities between OS/2 versions. Fourth, it's a flawed assumption that home users are less sophisticated, or less demanding, than corporate users.

(IBM officials have attempted to assure me that there won't be incompatibilities because all OS/2 versions will share a common code base but, frankly, I have my doubts about how long *that* will last. Hey, users are already reporting incompatibilities between OS/2 2.1 and OS/2 for Windows.)

IBM's mission should be to strengthen OS/2, not break it up. Give the next version all the functionality, and make it run in 4MB RAM. It can be done. If some components, such as SMP support, will initially appeal only to a few OS/2 users, make them external modules, like MMPM/2, or as add-in products, like Communications Manager/2. But let's not see OS/2 turn into Windows/Windows for Workgroups/Windows NT/Chicago/Daytona/ Cairo/ or who knows what.

OS/2 Magazine is here to support all OS/2 users, whether

you're in an enterprise setting or not. Yes, many of our articles, such as our series on NetWare or this month's feature on CID, will be of primary interest to people using or supporting OS/2 within a business. But a good part of each issue will be applicable to everyone using OS/2, like this month's article on the Enhanced Editor or Dave Reich's Tips & Tricks column.

OS/2 users are deeply committed to the future success of their operating system—that loyalty came through loud-and-clear in your comments about May's *Perspectives*. Thank you for reading and responding, and for caring about OS/2 and OS/2 Magazine.

Alan Zeichick

Alan Zeichick
Editor-in-chief

BACKUP, RESTORE, MANAGE AND SECURE YOUR WORKPLACE SHELL DESKTOP WITH DeskMan/2

**NEW!
VERSION 1.5
NOW AVAILABLE**

**DeskMan/2™ is the first
and only tool designed to
manage the Workplace Shell™!**

DeskMan/2 for OS/2 is unmatched in its ability to fully exploit the power and versatility of OS/2! Managers can use its security features to protect access to windows or objects. Administrators can easily and quickly standardize a department's desktops for maximum job efficiency. Individual users can quickly and easily migrate icons, objects and desktops between office and home machines. Or use **DeskMan/2** to backup and completely restore a custom desktop.

Incorporating the powerful **VUEMan/2™** virtual desktop & window manager; the potent new WPS snapshot facility; and more, **DeskMan/2** is packed with features!

New & Enhanced Features:

- Enhanced for ease of use
- Improved performance & functionality
- Improved window management
- Available object-level security
- Complete control over object menus
- New easy-to-use installer

Significant enhancements to every component!

- API & GUI for local & remote access - CID enabled & LAD/2 supported - Delete "undeletable" objects - Prevent the deletion of any object - Query any object for settings - Secure individual windows - Secure groups of windows	- Change multiple folders or icons all at once -- just drag and drop - Full administrative control of features - Restore, save, migrate any/all objects - Total management of Workplace Shell - And much more ... - Call DevTech for current info!
--	---

DevTech
Development Technologies, Inc.
Software Development & Technology Transfer
308 Springwood Road, Forest Acres, SC 29206-2113 Voice: (803) 790-9230 Fax: (803) 738-0218

© Copyright 1994 Development Technologies, Inc. All rights reserved. DeskMan, DeskMan/2 and VUEMan/2 are trademarks of Development Technologies, Inc. Workplace Shell is a trademark of International Business Machines Corporation. OS/2 and OS/2 Magazine are registered trademarks of International Business Machines Corporation.

OS/2 Users!

You deserve more **VALU** for your money

(Yes, we did spell-check this)

If you've got OS/2 software running on your company's computers, then you know what it's like to run a 32-bit, multi-tasking operating system. But



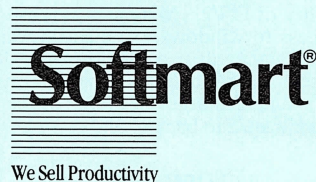
if you didn't sign up for IBM's new **VALU** agreement, then you might be paying too much for OS/2 licenses. **VALU** stands for Volume Additional License Usage, and is designed for

corporations that purchase quantities of software, but don't need books and diskettes for every end-user. With a minimum commitment of only 250 copies over two years (upgrades and/or new licenses), **VALU** makes sense so you can budget less dollars.

Qualified as an IBM Certified Enterprise Remarketer, Softmart has the know-how to help manage **VALU** reporting and ensure that you get the deepest possible discounts available. We back this with world-class technical support for OS/2 and related IBM personal software products.

So if you are buying OS/2 2.1, Communication Manager/2, DB2/2, OS/2 LAN Server, LAN Netview or other IBM Personal Software Products, contact Softmart to see how **VALU** can spell real savings for you.

CALL SOFTMART TODAY
800-272-6519



All IBM product names are trademarks of International Business Machines. All other product or company names may be trademarks or service marks of their respective owners. Prices do not include shipping and handling. Sales tax where applicable. Softmart is a registered trademark of Softmart, Inc. © COPYRIGHT 1994 by Softmart, Inc.

Letters

32 bits buys an advantage

Dear Editor:

In Amy Wohl's article, "What does 32-bits buy?" (March 1994, pp. 13-14), she states: "WordPerfect decided not to ship the new version of its OS/2 product" and added that OS/2 users will lose as a result. That may be true, to a certain extent, but WordPerfect will likely be the biggest loser. Lotus, DeScribe, and, of course, Microsoft will be the winner. Workplace OS is not too far from shipping, and anyone with a Workplace Shell application is just a little more than a recompile away from tapping that market. AmiPro will, very likely, come up with a Workplace OS version, but the same cannot be said for WordPerfect.

The word is that the next version of Windows will be much more object oriented, making it closer to OS/2 than Windows NT. Microsoft will have an advantage, as the developers of the OS, but Lotus will have a bigger advantage, having experienced programmers and a several-year head start in writing multi-threaded object-oriented applications. Once again, WordPerfect will be the loser, having no experience at all.

Personally, I don't see much of a future for WordPerfect. They'll be playing a losing game of catch-up to Microsoft with their Windows version, and won't even be in the game with OS/2 and Workplace OS. It might be just as well that they don't clutter up the OS/2 market with yet another single-threaded hack.

David Wright

Dear Editor:

After reading the May issue of *OS/2 Magazine*, I came across some inaccuracies I would like to point out.

In Rick Meigs' "Mysteries of the *config.sys*" (May 1994 pp. 47-53), under the "No Shell" section, the sentence that states "Without Workplace Shell, you will not be able to run any Presentation Manager (PM)-specific programs..." is untrue. Even if you replace the Workplace Shell with *cmd.exe*, as shown in the article's example, PM programs run fine. You can't click on an icon to run them, but if you enter the program's name from the OS/2 prompt, the PM program will execute.

I have a couple of other answers to the questions in David Reich's Tips & Tricks column ("Software Problems with Hardware," pp. 82-84). Regarding the question on dongles; changing the *IOPL* parameter to "yes" in your *config.sys* will help some programs that use dongles to work properly. And, in response to the question regarding the laptop LAN, I have seen the same error messages on my laptop. I solved the problem by placing the parameter **pauseonerror=no** in my *config.sys* file. Granted, if a true error occurs, my system won't pause; however, since I set the parameter to no only after I finish testing any changes to my system, I have never run into any problems with it.

Dwight Martin
via CompuServe

*You are correct. Running with *cmd.exe* in your *config.sys* as the **runworkplace** variable will indeed allow you to run Presentation Manager programs. As you point out, you must start them from the command line by typing their name. However, you should be warned of*

some problems that may arise as a result.

- *You must use the **start** command when starting any program, otherwise you will only be able to run one application at a time (PM or otherwise), since you have no shell support to start other command prompts.*
- *You cannot switch to a program on demand. That is to say that you must <Alt+Esc> through all of your running programs to get to the desired one.*
- *Other than *config.sys*, you have no system configuration support. For example, you might be able to print, but you will have no interface to the print subsystem. You will have no font or color palettes or any other system configuration tools afforded you by the Workplace Shell.*

So, yes, you can run PM apps without the Workplace Shell, but in a restricted fashion.

*As for the **iopl=yes** in regard to dongles, in general, the Shared Access check box is more effective and helps in the majority of cases where dongles are not working. Although **iopl=yes** may help, it is not a good idea to leave it set to yes unless you know for sure you need it, as it will allow any application to execute some restricted direct-hardware function calls.*

*As for **pauseonerror=no** in the *config.sys* file for the occasional laptop user, you are correct. I have found some other settings that help in specific situations and will be updating this information in a future issue.*

David Reich

Another

At the Indianapolis 500®, you only get one chance to get it right. No wonder lap after lap, the United States Auto Club (USAC®) depends on the mission-critical, pedal-to-the-metal performance of OS/2®.



engine serial numbers, and driver and crew status to personnel, administrative and other vital information. USAC's

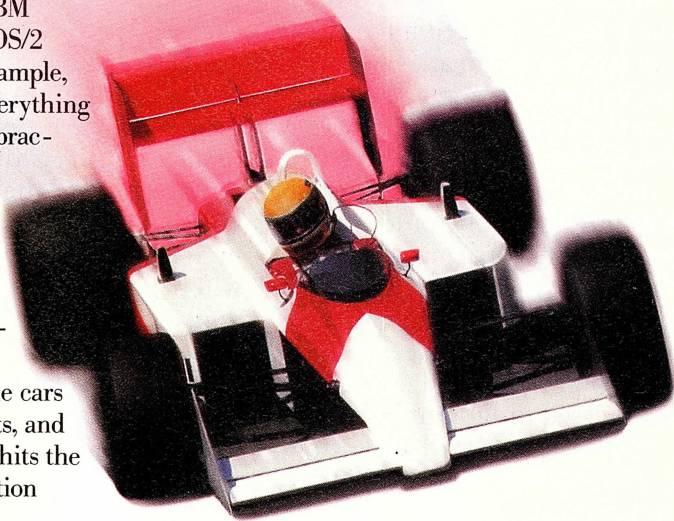


LapManager™, an OS/2 program developed specifically for Indy®, drives the official timing and scoring of all on-track activity.

LapManager takes timing data sent from the cars via radio signal, turns it into meaningful stats, and sends it to PCs used by USAC staff and the press. OS/2 even hits the road in ThinkPads® that collect and distribute race information from tracks all across the country.

From start to finish, OS/2 2.1 sets the pace for technology at the most famous motor speedway in the world. OS/2 programs run at full speed all over the place: IBM DATABASE 2™ OS/2 (DB2/2™), for example, keeps track of everything from entry fees, practice and qualifying times,

clutch



performance at Indy.

When you see how OS/2 can rev up *your* DOS, Windows™ and OS/2 programs, you'll know why they use OS/2 at Indy and over 100 other USAC races. You can't have a more impressive track record than that.

To order or to find out more about OS/2, call 1 800 3-IBM-OS2. In Canada, call 1 800 465-7999. OS/2 is also available at local software dealers.

Operate at a higher level.™

This ad was created by LINTAS and got to this publication on time using DOS, Windows and OS/2 programs running on OS/2. IBM, OS/2 and ThinkPad are registered trademarks and IBM DATABASE 2, DB2/2 and "Operate at a higher level" are trademarks of International Business Machines Corporation. Windows is a trademark of Microsoft Corporation. Indianapolis 500 and Indy are registered trademarks of the IMS Corporation. All other products are trademarks or registered trademarks of their respective companies. © 1994 IBM Corp.

New drivers for old problems

MWAVE AND NETWARE DRIVER WATCH BY ALEXANDER ANTONIADES



One of the latest technologies being talked about is the Digital Signal Processing (DSP) chip. The industry journals are touting DSP chips as the herald of a new age of computing, the likes of which has only been seen in AT&T commercials.

DSP chips are special-purpose CPUs used to translate analog information into digital information a computer can process. The argument for putting a DSP chip in your computer is that, as software technology improves and new communication standards arise, you'll be able to instruct your computer to digest the analog information it receives—in a new way. So you can buy a device today that will be software-upgradable to new standards, such as the upcoming V.fast modem protocol or color fax.

Part of what people are counting on to make such communication possible is a piece of technology from IBM called Mwave that acts as an interface between the operating system and different DSP chips. Any application that needs to use a DSP to process data only has to talk to Mwave, instead of having to write a different set of commands for every chipset.

Mwave cards are starting to make their way into the marketplace and a few have already been released from IBM and Best Data. These cards are, for the most part, being marketed as faxmodems with soundcards built in, but some of the cards also in-

clude CD-ROM drive interfaces.

The only problem, as usual, are the OS/2 drivers. Vendors currently only offer Windows drivers for most Mwave functions, but these Windows virtual device drivers will not work under OS/2. The good news is that IBM officials have hinted that Mwave will be more integrated into OS/2 in future releases.

Ideally, once all of the Mwave drivers are finished, they should work with any Mwave board. But the non-standard standard is the oxymoron we live with in the computer industry, so don't buy one of these cards until you can hold the driver disks in your hand.

NetWare and OS/2 part deux

The marriage between OS/2 2.x and Novell's OS/2 Requester 2.01 could best be described as a shotgun wedding. Both companies compete with each other in the server software arena and, to a lesser extent, in the operating system arena. But, as IBM sought to sell OS/2 outside the confines of the Big Blue shop, they discovered that NetWare connectivity was more important to corporate America than they had previously realized. As a result of this discovery and Novell's squabbles with another major operating system vendor, both companies found it in their best interest to cooperate with each other to work things out.

Since the OS/2-NetWare connectivity bugs, embarrassingly enough, came from both products,

IBM and Novell each agreed to fix their own. IBM's fixes came in the form of the 2.11 Service Release and Novell's fixes have arrived with version 2.1 of the NetWare Requester.

The NetWare Requester 2.1 includes some new features, but mostly it squashes bugs. Of the new features, RPL support allows remote installation of the requester and the requester documentation is included on-line in .inf format. The areas that received the most attention from bug squashers (because they needed it) included virtual DOS and Enhanced mode Win-OS/2 support and named pipe support. One of the biggest improvements in this release is the installation program, which will now help configure multiple network protocols.

Assuming all of these problems are fixed, what's next? The only technical obstacle remaining is NDS (Novell Directory Services) access under Win-OS/2 and Virtual DOS. According to Novell, the current OS/2 code doesn't allow it. But if enough people complain about it in this era of IBM-Novell detente, that too will probably be fixed.

The NetWare Requester 2.1 works with all versions of 2.x, although the 2.11 Service Release is recommended. The requester and on-line documentation can be downloaded via NetWare. In addition, the requester files are available via the Internet at [ftp.cdrom.com](ftp://cdrom.com) and should be on the next release of the Hobbes CD-ROM.

SHARE TECHNOLOGY CONFERENCE

August 7-12, 1994 ♦ Boston

Maximize the computing potential that exists on your desktop! The SHARE Technology Conference offers more than 250 technical sessions, tutorials, concept overviews, demos and hands-on labs covering hot industry topics, including:

- ♦ OS/2®, Lotus Notes®, Novell Netware®
- ♦ Object-oriented technology
- ♦ Client/server and enterprise information management
- ♦ Personal systems hardware
- ♦ Application development
- ♦ Multimedia

Don't miss:

- ♦ Outstanding presentations by industry leaders David Moskowitz, Timothy Sipples and Paul Giangara
- ♦ The SHARE Technology Exchange, featuring the latest, most innovative technologies for IBM and open systems coexistence

For complete conference details, contact SHARE at:
phone: 312/822-0932
fax: 312/644-6363
Internet: sharehq@share.org



What is Office Automation now?

THINGS CHANGE, BUT THE GOAL REMAINS THE SAME. BY AMY D. WOHL



The term Office Automation has been making its way around front-office (as opposed to data-processing) departments since the mid-1950s, shortly after the initial commercialization of computers. At first, Office Automation was perceived as a way to replace low-level clerical workers with shiny, efficient, and cheaper machines—a theme song that has been sung as a kind of Office Automation chorus, repeated at intervals. As the computers evolved, office work and office workers changed, and we struggled to work more efficiently.

In the mid-1960s, secretarial work began to change significantly through the invention and marketing of word-processing, but no one seemed to refer to it as Office Automation. The emphasis was similar to those first clerical-focused efforts—change the work to fit what the machines can do, make the people learn the machines, and justify everything on the basis of replacing expensive (and unreliable) human labor with cheap (!?) and consistent computer-mediated output.

The word-processing of the 1960s and 1970s changed the relationship between bosses and secretaries; it made some secretaries into new kinds of professionals and a few into supervisors and programmers. Some escaped the secretarial

ghetto forever, but given the changing times and changing attitudes towards work and women, it may have happened anyway. But this (pre-PC) word-processing frenzy that probably affected, at most, two or three million people was still separate from the rest of office work. People still filed on paper, distributed on paper, and sent paper telephone message slips around organizations.

In the early 1980s, the term Office Automation surfaced again. This time, it was used to describe a set of computer-based technologies that were being used in an integrated way to support professional and administrative office work. New terms like electronic mail and calendaring then entered the vocabulary.

We had great visions and splendid intentions, but it was hard to justify building an entire infrastructure based on the relatively small amounts of information collected on how this relatively large investment (perhaps \$35,000 per user or more) might be balanced against cost savings or increases in revenue.

A few firms invested in small pilots to test the technology; others were more aggressive, but it took the advent of the explosive growth of the personal computer market during the mid to late 1980s to provide a serendipitous infrastructure against which office automation—now sometimes

called workgroup computing or groupware—could be viewed as an easily justified incremental and highly leveraged cost.

Now we do our office computing, not in isolation, but as members of multiple networks and relationships. The term Office Automation seems quaint or obsolete, hinting at mini-computers and mainframes, instead of the PC-based architectures preferred today. But on reflection, it seems familiar without being particularly enlightening.

For more than 10 years, users have greeted me at conferences and airport lounges challenging me to find a new name for Office Automation. The analysts who follow this industry sector have certainly tried.

Office Information Systems seems a promising term, but we keep adding technologies that are used in the data-processing department as well as the office.

The French consultant Louis Nauges coined the term (copyrighted to him, but loaned to his language) *Bureautique*, by which Office Automation is known in France.

Groupware was a popular term for some time, but that popularity is now waning, perhaps through overuse. It has a precise meaning, software to support the cooperation, coordination, scheduling, and negotiation of the work done together in groups, which is only part of Office Automation. In the

office, we sometimes work together and sometimes work alone. A perfect name would reflect that.

Informatique has been proposed by some, especially users in the health care professions. But it seems to have a lot to do with content and perhaps not enough to do with process. We need to consider both.

So, what is Office Automation in 1994? A collection of tools used to support office work that might be obtained by buying a set of integrated tools from a single vendor or, more likely, by mixing and matching tools from many vendors and binding them together in a preferred de facto standard computing environment, such as OS/2, Windows, Unix, Macintosh, NT, or a combination.

Today, that assortment would probably include e-mail, word-processing, calendar and scheduling, and file sharing. But it's likely

to include tools for creating custom interfaces and applications, a shared workspace for collaboration, support for remote users and a virtual office facility, group databases (including document databases), document management, and work flow processing. And that's just today's list!

That's probably the point. An appropriate name for Office Automation is not only elusive (because exactly what we do in offices and what we want for support changes over time), but the combination of tools that might be available and the ways we can combine them is constantly changing. Who would have imagined Apple putting DOS on a Macintosh or Microsoft's Windows on a Sun Unix machine?

Another important element has also changed. Since much of the early focus in office automation was on cost savings, you had to be able to show you could save more

money than you spent. Often, these savings were more illusory than real, but the need for counting beans was viewed as a requirement to making investments already seen as risky, since they rested on new technology.

We are now seeing a different attitude. Customers are viewing investments in office technology as a normal aspect of doing business, a part of the normal overhead expense. Customers don't even ask for cost justifications for individual PCs any more. We don't cost-justify desks and chairs, do we? We do need to see the cost of an appropriate level of office information infrastructure built into our overhead structure and reviewed and adjusted on an annual basis.

We can no longer do business without our electronic tools and we can't do business without the connections that turn the people and the tools into an office system that's capable of solving problems and creating new products and services. An office automation system is named based on whatever tools happen to be included this year.

For OS/2 users, Lotus has been an important ally. Not only is it the most important groupware product (Notes has been, from the start, based on an OS/2 server), but Lotus is the only vendor to offer an OS/2 office suite. While office suites are sets of individual user tools, instead of group tools, we have high hopes that the grandchildren of these combinations of word-processing, spreadsheets, databases, graphics and presentation tools, and e-mail will grow up, in their client/server future, into the office automation enablers we dreamed of years ago.

Amy D. Wohl is president of Wohl Associates, a consulting firm specializing in office information systems, personal computing, and end-user computing. She is also editor of the Trendsletter, a monthly newsletter on computer industry trends.

Take control of your OS/2 scheduling needs with

ATS

Version 2.0b

Advanced Task Scheduler for OS/2

Are you looking for a way to manage your production job streams? Do you have programs that need to run after the completion of one or more other programs? Do you want to process files that have just been received from another system or modified locally? Do you need to schedule around holidays and periods of heavy CPU load?

With ATS, you can accomplish all of this and MUCH MORE. With ATS you can run your programs when YOU want them to run and you don't even have to be there to start or monitor them.

Here are some of the features of ATS for OS/2:

- * Create True Job Streams
- * Programs can be scheduled to run anytime.
- * Programs can be dependent upon Files, Other Programs, Holiday Schedules, and External Signals
- * Complete Logging - To File and Console
- * Console Display of Running Tasks
- * Console Display of Holidays, Events and Tasks
- * Programming Interface for External Signals
- * Only \$249.00

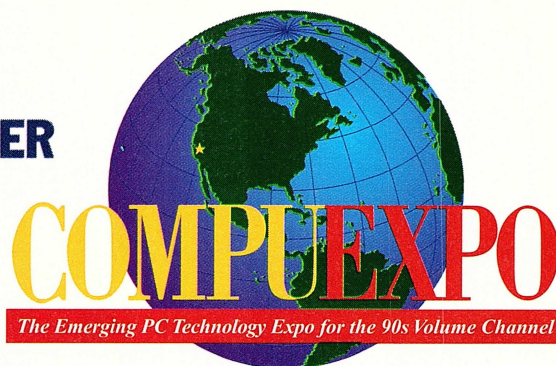
MHR

Software and Consulting

2227 U.S. Highway #1 * Suite 146 * North Brunswick, NJ 08902
Voice: (908) 821-0359 Fax: (908) 821-0350

Reader Service No. 10

SEPTEMBER 14-16, 1994
SAN JOSE CONVENTION CENTER
SAN JOSE, CALIFORNIA



**SEE THE HOTTEST EMERGING BRANDS AND
BREAKTHROUGH TECHNOLOGIES**

Profit from opportunities with new vendor partners. See the latest technology to hit the market. As the 90s volume channel grows, partnerships with emerging brands is crucial. Tomorrow's technology leaders will be at COMPUEXPO '94—eager to make deals WITH YOU!

**GET A JUMP START ON THE FOURTH QUARTER
PEAK SELLING SEASON**

Get a head start on the peak selling season by attending COMPUEXPO '94. Held in September, you can see the latest innovations and make the partnerships and deals to guarantee that products will be on the shelf in time for the 4th quarter selling season.

**LOCATED IN SILICON VALLEY—
THE NERVE CENTER OF PC TECHNOLOGY**

If it happens in the PC industry, it happens in Silicon Valley, California. While attending COMPUEXPO, take advantage of the location to make sales calls and see business partners in the area. San Jose and COMPUEXPO '94 offer an exciting marketing opportunity that you cannot afford to miss!

**ESTABLISH INTERNATIONAL TRADING PARTNERS
AT COMPUEXPO '94**

Make inroads to the international market and build your business abroad. COMPUEXPO draws exhibitors and attendees from every corner of the globe—Austria, the Czech Rep., France, Germany, Egypt, Mexico, Canada, China, Taiwan, Australia, Japan, and more.

**YOUR FUTURE BUSINESS PARTNERS WILL
BE AT COMPUEXPO '94**

But the deal-making and learning doesn't stop on the exhibit floor. COMPUEXPO FORUM offers keynotes, panels, and discussions with industry leaders where you can gain insights into the changing PC technology market. Receptions and roundtables introduce you to future business partners.

PRODUCTS ON DISPLAY

Hardware Platforms
Operating Systems & Utilities
Emerging Technologies
State of the Art Board Level Products
Networking and Communications
Storage Products and Peripherals

Vendor Partners.

Emerging Markets.

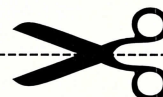
Volume Buyers.

Increased Margins.

Channel Penetration.

Profit Opportunities.

Be there.



YES

Sign me up for COMPUEXPO '94. I understand that COMPUEXPO is **FREE** if I register before August 8, 1994. On-site registration is \$45.



Send me information on exhibiting at COMPUEXPO.

Name

Title

Company

Address

City

State/Province

Zip/Postal Code

Phone

Fax

OSCEP

For more information on attending or exhibiting at COMPUEXPO '94, call **(415) 905-2354**. COMPUEXPO is managed and produced by Miller Freeman, Inc.

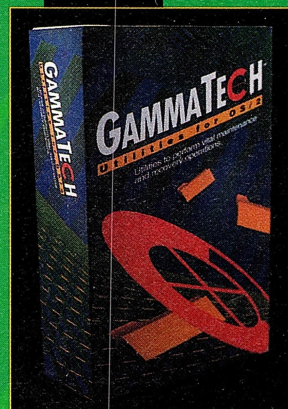
Return by mail to: COMPUEXPO
Attn.: Marcia Gulino
600 Harrison Street
San Francisco, CA 94107
Or by fax: **(415) 905-2220**.
Internet: compuexpo@mfi.com

The **GammaTech Utilities** are designed to enhance and complement your OS/2 system. These utilities provide the ability to perform vital maintenance and recovery operations easily without extensive technical knowledge. Use **GammaTech Utilities** for your critical data or you might lose it.

LOSE IT

GAMMA TECH™

Utilities for OS/2



- Undelete Erased Files
- Optimize HPFS and FAT Volumes
- Backup INI and Desktop Files
- Recover HPFS Volumes
- Protect and Backup Boot Sectors
- Identify and Mark Bad Sectors
- Reconstruct Boot Sectors
- Protect/Lock Files
- Permanently Erase Sensitive Data
- Mass Delete Selected Files
- Sort FAT Directories
- View and Edit Selected Files
- Disk Sector Edit (ASCII or Hex)
- Display Volume Information
- Alter File Attributes
- Add Comments to Files
- Display File Fragmentation
- Display Directory Information
- SAA/CUA Compliant PM Interface



(405) 947-8080



Come See us
At OS/2 WC&E
Booth #609

(405) 632-6537 fax



SofTouch Systems, Inc., Workstation Division
1300 S Meridian, Suite 600, Oklahoma City, Oklahoma 73108

For OS/2 Version 2

VISA, MasterCard, American Express, C.O.D. • Overnight Service Available

QwikSwitch 32 and AMOS

HOT KEYS AND HPFS ACCESS BY BRIAN PROFFIT



Some of us never learn. The Workplace Shell has (largely) liberated us from the days of having to remember convoluted directory trees and having to drill down four or five levels to find the subdirectory we needed. So, what do we do? We put folders within folders, so we go through the same drill-down process graphically, and fill the desktop with open folders. This is just one of the problems QwikSwitch solves.

Hot key program activation

With QwikSwitch, you can activate up to 72 different programs by using unique hot-key combinations. You don't have to worry about which folder the program is in, or how deeply nested that folder might be.

For example, no matter what is showing on your desktop, pressing <Ctrl+Shift+W> will bring up an OS/2 command window. That's a lot easier than opening the OS/2 System folder, opening the Command Prompts folder, and finally, opening the command window. If a command window is already open, the hot key switches to it, if not, it will open a new one. Of course, all keys can be assigned to any program you like.

One problem with QwikSwitch is that it works by intercepting (called "hooking") the input keys before they are passed to your application. Unfortunately, OS/2

**You can
activate up to 72
different programs
by using unique hot-
key combinations.**

bypasses that input hook if the keys have been defined by the application as accelerator keys. Worse, this mechanism interprets a <Ctrl+Alt> combination as if the <Ctrl> key hadn't been pressed. In other words, if your application has defined <Alt+F> as an accelerator to open the File menu, QwikSwitch won't receive <Ctrl+Alt+F> hot keys when you are in that application, unless they are pressed twice.

Realistically, this cuts the number of available hot keys in half to include only the <Ctrl+Shift> combinations. That's not a major problem, however, since you aren't likely to remember more than 40 different key combinations anyway.

QwikSwitch isn't just for OS/2 programs. You can QwikSwitch to Windows and DOS sessions as well. QwikSwitch will use the specific DOS and Windows settings defined for each of those sessions, automatically.

In fact, QwikSwitch isn't just for starting programs; you can use hot keys to open folders, lock up the system, or perform a shutdown. You should note, however, that whenever the system is locked up, whether by QwikSwitch or by OS/2's normal security features, QwikSwitch will be disabled. You must re-enable it with a <Ctrl+Shift+keypad(+)> to use hot keys again. If you frequently leave your system idle and use OS/2's timed lockup facility, re-enabling can become somewhat annoying.

Great for Notebooks

A more subtle benefit awaits those who use notebook computers. Many times, you can't or don't want to bother using a mouse with a notebook computer. Maneuvering through multiple applications and folders without a pointing device can be a painful process. QwikSwitch streamlines the process. Of course, you can go even further and do without the hot keys.

QwikSwitch includes a QwikTalk module, which works with IBM's Continuous Speech Series (ICSS). If you're running ICSS on your system, QwikTalk can recognize 75 spoken commands and switch to the program when you speak its name. The commands are generic words like "word-processor" and "mail," as well as more specific words like "OS/2 window" and of course, "solitaire."

This feature is especially useful for the physically challenged, but pro-

AMOS has some restrictions, but what it does offer is extremely valuable.

vides some drawbacks. First, listening for speech takes up a lot of system resources. You can expect your system to slow down. However, QwikTalk disables the microphone if it doesn't detect commands in a specified period of time. You can configure that time lag, but for performance you will probably keep it at the minimum 20 seconds so that your system isn't impaired while you go about your normal work.

You do, however, have to press <Ctrl+Space> to reactivate the microphone when you want to use it again. Pressing keys so that you can use a microphone doesn't seem like a major productivity improvement.

Glee or Flee

Setting QwikSwitch up isn't terribly difficult, but it isn't trivial either. Novices may want to stay away (although the corporate MIS staff may want to take advantage of QwikSwitch as a way to standardize program selection methods for novices).

It may seem somewhat strange to use a keystroke-based product with a graphical user interface like the Workplace Shell. I think it's best to be as productive as possible, by whatever means required. Users with a lot of programs and/or a small desktop will find that QwikSwitch enhances the Workplace Shell by providing a smooth new navigation technique.

AMOS 1.2

Nobody argues the fact that OS/2's High Performance File System (HPFS) runs faster than the File Allocation Table (FAT) file system and even the Super FAT system in OS/2 2.1. HPFS is more resistant to the fragmentation problems that slowly erode the performance of FAT partitions over time and it removes the 8.3 character limitation on file names. It's clearly easier to locate a document named *Product Info - Jefferson Corp.*, than

one named *jeffrson.wp*. So, why isn't everyone using HPFS? Probably because HPFS partitions cannot be accessed from DOS—or can they?

AMOS, one of the most valuable OS/2 shareware offerings, helps bridge the gap. It runs under DOS and provides limited access to HPFS partitions. AMOS has some restrictions, but what it does offer is extremely valuable.

What it Does

AMOS acts as a command shell that runs under DOS. It loads directly from a DOS command line and displays its own command prompt. It can also run a command immediately upon starting and before going into prompt mode. Another parameter instructs AMOS to run the indicated command and exit back to the DOS prompt immediately.

When you use the AMOS shell, you can read, write to, and even manipulate HPFS partitions (indicated only as invalid drives outside the shell) more simply than under OS/2. For example, if your computer is re-booted without having shut down OS/2 properly, when you restart, OS/2 automatically runs the CHKDSK program to check file allocations, extended attributes, and other aspects of your fixed disk structure. How does it know to run this action? When the system starts, it raises a flag indicating that the disk structure has been changed since the last shutdown. The disk is, therefore, "dirty." During shut-

down, when the disk buffers are all written and all files are closed, the dirty flag is lowered.

If, at the beginning of the boot process, OS/2 sees the dirty flag, it knows shutdown wasn't completed and that a CHKDSK will be required. On large disks containing many files, the CHKDSK process can take a long time. There might be circumstances under which you might want to avoid such a delay. AMOS provides an easy way to do that. Boot DOS from disk, enter the AMOS shell, and execute the AMOS command **dirty c: off**—even if your c: drive is formatted for HPFS. This technique can be helpful, but it can also be risky. I wouldn't recommend it in all situations—after all, OS/2 runs CHKDSK to find and fix errors.

You can execute a variety of other commands with AMOS, including file copy and delete and drive free space analysis. You can even access extended attributes directly.

What it doesn't do

AMOS only allows you to run its commands. You cannot run DOS programs. It won't let you run programs, such as the Norton Utilities, against HPFS files. If you want to do so, you will need to use the Gamma-Tech utilities. Allan Mertner, the author of AMOS, is working on a device driver version that will allow normal DOS to execute against HPFS files (but don't expect Norton or Central Point utilities to work on HPFS—they're fundamentally different). The current version is limited to 23 internal commands. If you want to modify an HPFS file directly, you can only run the AMOS editor, which is limited to 2,000-line files.

The limits don't matter

AMOS is designed to help when problems arise. It isn't intended as a product for long-term constant use of HPFS files by native DOS. The DOS sessions that run while OS/2 is operating can access HPFS

partitions just fine—you don't need native DOS for that. As long as you limit your file names to the 8.3 convention, your DOS programs can access HPFS data without any problems under OS/2.

AMOS is especially useful when a problem occurs. Say, for example, you modified your *config.sys* file in a way that prevented OS/2 from booting. To correct this problem using OS/2, you would have to boot from the installation disk and disk 1. Then, to modify *config.sys*, you would have to use an editor that didn't require Presentation Manager or the Workplace Shell. No such editor is included with OS/2, and users usually revert to shareware products or, more often, just boot from a DOS disk and use a DOS editor.

The DOS solution doesn't work on an HPFS partition, however—or at least it didn't before AMOS. AMOS's 2,000 line limitation doesn't sound so bad when you

consider that its main purpose is to fix the configuration file.

Glee or Flee

The real benefit of AMOS isn't its 23 internal commands, but the confidence it gives people to convert to HPFS. For \$31 you can be assured of the ability to access your HPFS files—even if you happen to trash OS/2. I could argue that you could accomplish this without AMOS, since OS/2-DOS sessions can access HPFS and small character-based editors are widely available as freeware. But, for many, AMOS is exactly what they need to convince them that it's safe to move to HPFS. \$31 will buy the least expensive system performance boost you have ever purchased.

Brian Proffitt has been in the computing industry for 20 years. He was part of IBM's OS/2 team, left IBM to become the director of PC Week's Corporate Labs, and is now the presi-

dent of Visionary Research. Brian is the author of two books on OS/2, is a contributing editor for OS/2 Developer and OS/2 Magazine. He can be reached on CompuServe at 75300,1466, or Internet 75300.1466@compuserve.com.

RESOURCES:

QuikSwitch 32 1.2c (\$39.95)

BitWare Consulting
1729 8th Ave.
New Westminster, BC V3M 2S8
CIS: 72303,412

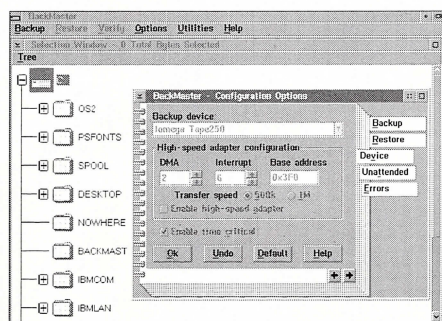
READER SERVICE NO. 151

AMOS 1.2 (\$31)

Allan Mertner
Enghavevej 20A, 2tv
DK-1674 Copenhagen V, Denmark
FidoNet: 2:234/107 or 2:234/156
OS2Net: 81:445/14
CryptoNet: 70:450/0
CompuServe: 100327,2035 - AMOS registration
ID: 1808

READER SERVICE NO. 152

BackMaster™ is your OS/2 2.1 Backup Solution



Requires OS/2 2.1 and 8MB of memory

Full, partial, incremental, and unattended backups
Disaster recovery utilities included
Supports FAT and HPFS file systems
Backs up the desktop, long file names, EA's, INI files, and system files
Automate backups with command line arguments
Bi-directional DOS compatibility with industry standard QIC 40/80 formatted tapes
Automatic verify after backups
Move DOS & Windows files to OS/2 using tapes
Transparent background operation

BackMaster supports most QIC 40/80 drives:

- ☒ Colorado Jumbo 120/250
- ☒ Conner 250
- ☒ Mountain FileSafe 4000/8000
- ☒ Generic QIC 40/80 as 2nd floppy
- ☒ Iomega TAPE250
- ☒ Archive XL Series
- ☒ Summit SE120/250
- ☒ Parallel QIC 40/80*

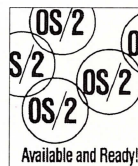
BackMaster supports most Hi-Speed Adapters:

- ☒ Colorado FC-10/TC-15
- ☒ Conner XL Hi-Speed Adapter
- ☒ Iomega Fast Floppy Controller "AT"
- ☒ Generic 2.88MB floppy Controller

New Version

* Call for more information

Parallel Tape Drives
Now Supported*



\$79.95

30 Day
Money-Back

MSR Development

P.O. Box 632070 Nacogdoches, TX 75963
Voice: (409) 564-1862 FAX: (409) 560-5868
BBS: (409) 560-5970 - Call our BBS for a Free Demo!

Everything you'll need to get started using
this built-in OS/2 application.

BY STEVE GALLAGHER



A secret guide to The Enhanced Editor

Most new OS/2 users take a quick peek at the applets inside the Productivity folder, then close it down and forget about it forever. The sparse documentation, combined with the somewhat minimalist level of function in some of the applets, tends to leave users uninterested.

Don't be so hasty. There's gold in that folder, if you know where to look. I'm specifically referring to the Enhanced Editor application, a versatile general-purpose text editor with enormous hidden capabilities. The Enhanced Editor (EPM) has been designed to

offer solid function to a wide variety of users and needs. Whether you're writing a simple text file, programming in C or REXX, or running EPM as the front end for a TCP/IP mail application, EPM's raw power is worth a close look. Here are some of the features in EPM that you might not know exist:

- A built-in command shell, accessible through a menu option or the SHELL command.
- A powerful search capability, including searching a selected region of text, a grep-like regular-expression search, reverse search, and bookmarks.
- Surprisingly powerful printing support, including near-WYSIWYG output and a preview capability.
- Language-sensitive editing, using the EXPAND command to turn syntax expansion on and off. EPM is "aware" of *.c*, *.pas*, and *.cmd*, as well as its own internal E language's *.e*.

Guided tour

Let's begin our tour of EPM by double-clicking on the Enhanced Editor object in the Productivity folder. We are now looking at a new, untitled EPM file (Figure 1). This file is an ideal starting point for examining EPM's basic editing techniques. The most obvious thing you will notice is that we are dealing with a menu-driven, mouse-driven application. But if you're like me, and find you often prefer issuing commands and pressing function keys to

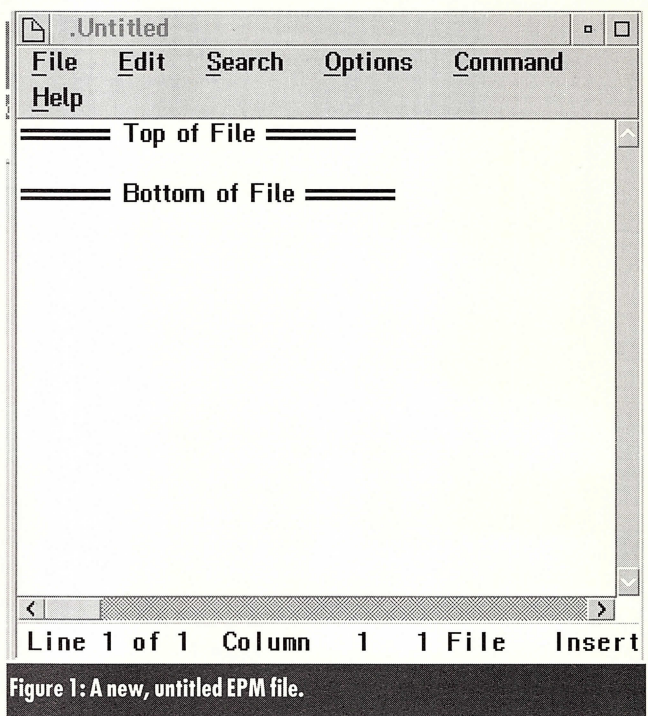


Figure 1: A new, untitled EPM file.

Table 1: Edit menu items.

Item	Description	Keyboard Shortcut
Undo line	Undo changes in current line	<Alt+Backspace>
Undo	Undo changes	<Ctrl+U>
Copy	Copy marked area to clipboard	<Ctrl+Ins>
Cut	Cut and move to clipboard	<Shift+Del>
Paste	Insert text from clipboard	<Shift+Ins>
Paste lines	Insert and add lines	—
Paste block	Insert text as a block	—
Style	Change font, colors, and attributes	<Ctrl+Y>
Copy mark	Copy marked text to cursor	<Alt+C>
Move mark	Move marked text to cursor	<Alt+M>
Overlay mark	Overwrite at cursor with text	<Alt+O>
Adjust mark	Overwrite at cursor and leave blanks at original position	<Alt+A>
Unmark	Unmark all marked text	<Alt+U>
Delete mark	Remove marked text	<Alt+D>
Print mark	Send marked text to printer	—

Table 2: Search menu items.

Item	Description	Keyboard Shortcut
Search	Input your search parameters	<Ctrl+S>
Find Next	Find next hit on search string	<Ctrl+F>
Change Next	Repeat the last Change command	<Ctrl+C>
Bookmarks	Create a bookmark, or find/list existing bookmarks	—

pointing and clicking, you will be glad to know that most mouse actions and menu options have either a function key or command equivalent.

Right away, we ought to give our text file a name. Select the FILE menu option with the mouse, then select the RENAME pull-down item (or simply press <F7>). Give the file some descriptive name and press <Enter>. Now we're ready to explore. To enter some text, just start typing. Once you have a few lines of text entered, we can begin to look at the more unusual options EPM provides to act upon this text.

First let's look at the EDIT menu item. As you can see, many of the pull-down items now available are "block-oriented," meaning that they are designed to work on marked blocks of text. You can mark a block of text by placing the pointer at the upper left corner of the block to be moved, then, while holding down the left mouse button, drag the pointer to the lower right corner of the block to be marked. Or, you can use the key-stroke equivalent: place the cursor

at the upper left corner, press <Ctrl+B>, move the cursor to the lower right corner, and press <Ctrl+B> a second time. Table 1 lists the EDIT options.

As you can see, you have at your disposal a fairly thorough set of text-manipulation options, accessible through a familiar block-oriented paradigm. The options available under the SEARCH menu item, shown in Table 2, are also what you would expect from a solid, competent text editor. You will note that the Search dialog box, shown in Figure 2, has several features: selection of case-sensitivity, find-then-change, grep regular-expression search, and even a reverse-search (from the bottom of the file to the top).

Advanced Features

As you become more comfortable with EPM, you'll start to find your-

self bumping up against limitations and defaults that have you thinking about ways to tweak the program to get it to act the way you want it to. You have plenty of options—one of EPM's biggest benefits is its extensibility.

Let's explore EPM's printing options (Figure 3). First, EPM offers you two output options: Draft Mode and WYSIWYG Mode. Draft Mode is ideal for printing

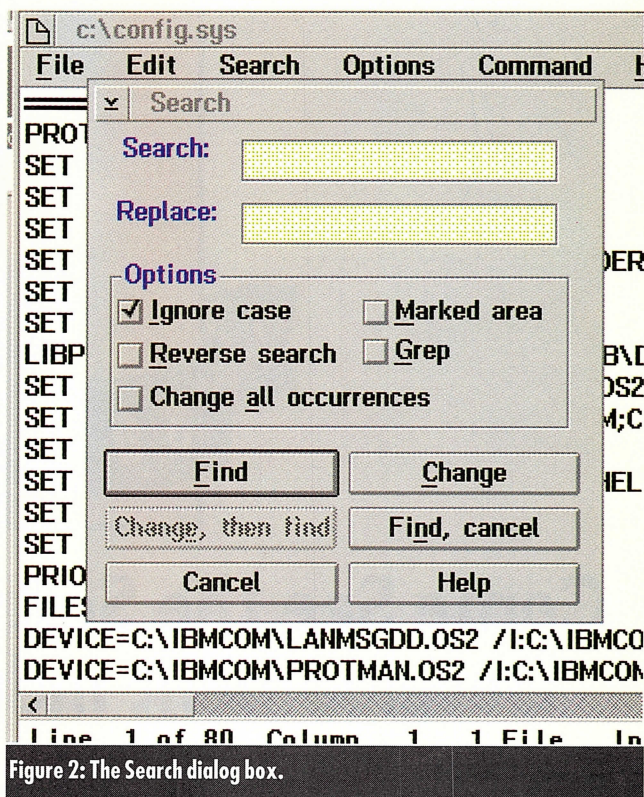


Figure 2: The Search dialog box.

We'd like to dispel a couple of myths about client/server testing.

Myth #1: Client/Server testing is easy.

New development tools make client/server applications easier than ever to build. The problem is, they're harder to test, and you just can't stand up to them with manual testing methods. **You need ATF, the only testing product designed for client/server.**

Myth #2: Client/Server testing is impossible.

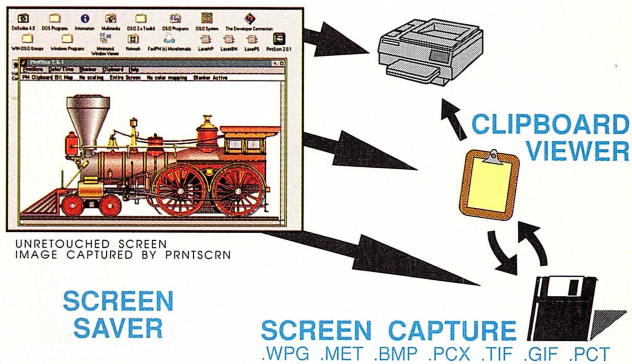
Testing client/server applications can be daunting. The problem is, your tests need to replicate real-world conditions, and you just can't do that with a stand-alone testing tool. **You need ATF, the only testing product designed for client/server.**

The Automated Test Facility's unique architecture makes it the only product for true client/server testing of OS/2 and Windows applications.

If you're coming to OS/2 World in Santa Clara this July, stop by Booth 615 for an ATF demo. **There's only one way to test client/server applications, and that's with ATF.**

Softbridge, Inc. 617-576-2257 (Phone) 617-864-7747 (FAX)

SINGLE KEY-STROKE SCREEN PRINTING

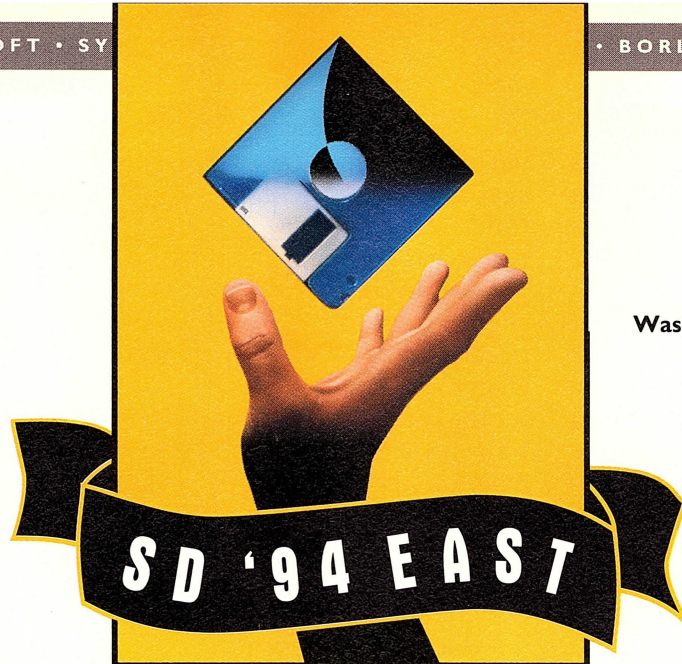


- Quality Color or Black & White copies of color Desktop Images.
- Copy any portion of any image on the Desktop.
- Screen Saver prevents monitor burn-in.
- Date & Time Display for Time-Stamping images.
- LAN installable. Complete support for LAN attached printers.
- Economical! 4 Utilities for 1 Price! Entry licensing available.
- The most stable and reliable product available.
- Includes both OS/2 2.1/2.0 (32-bit) and OS/2 1.3 (16-bit) versions.

THE LEADER: **PrntScrn™** Screen Image Utility for OS/2



MITNOR Software
Phone: (918) 357-1628
Fax: (918) 357-2869



Conferences,
October 3 - 7, 1994
Exhibition,
October 4 - 6, 1994

Washington Convention Center
Washington D.C.

Come See the Software and Application Development Industries Come Alive!

"The best speakers, the best demonstrations, and the best exhibition!" *Terry McIntosh, Analyst - Chevron Corp.*

SD '94 East delivers development solutions across the spectrum of tools from C++ to Powerbuilder.

- Client/Server Tools
- Object-Oriented Tools
- Rapid Application Development Tools
- Database Design and Modeling Tools
- CASE Tools
- GUI Front Ends
- Languages
- Configuration Management Tools
- Testing and Debugging Tools
- Porting Tools
- Multimedia Tools

SD '94 East provides powerful, real-world, real-time education in 4 jam-packed conferences.

SD was the first and continues to be best at bringing you practical, unbiased guidance in over 200 classes across 17 tracks.



Join us at SD '94 East as the industry comes alive...

...on the show floor, in the conference sessions and in a series of special events with key industry players.

- 4 Plenary sessions include:
Mitchell Kertzman, CEO, Powersoft
Christine Comaford, *PC Week*
Vaughan Merlyn, Partner, Ernst & Young
- Hours of free technical sessions by Microsoft, Powersoft, Intersolv and others
- The C++ Programming Superbowl



Tools and Techniques for Software and Application Developers

Call for a Brochure!

1-800-441-8826
415-905-2784
Internet: sd94east@mfi.com
FAX: 415-905-2222

out a quick-and-dirty copy for review before printing your final

copy. WYSIWYG mode (What You See Is What You Get) is actually only

funky fonts and sizes.

Let's also take a closer look at the Style dialog box (Figure 4) accessible under the EDIT menu. This dialog box enables you to create a text style consisting of a font, a font size, attributes such as bold or italics, and even a foreground and background color. You can then select Apply to apply the style to a marked block of text, or use the powerful Register pushbutton to register the style with EPM and save it, making it available for reuse any time you want it.

You also have a Preview button that displays an approximate on-screen image of what your printed output will look like. I recommend that you always use Preview to be sure the output will match your expectations, especially if you play around with

You probably noticed earlier that we ignored the OPTIONS menu item. This item offers enough power-user features to justify a separate, detailed explanation. Specifically, I want to explore the options available under Options/Preferences. Here we see the following: Settings, Advanced Marking, Stream Editing, Ring Enabled, and Stack Commands.

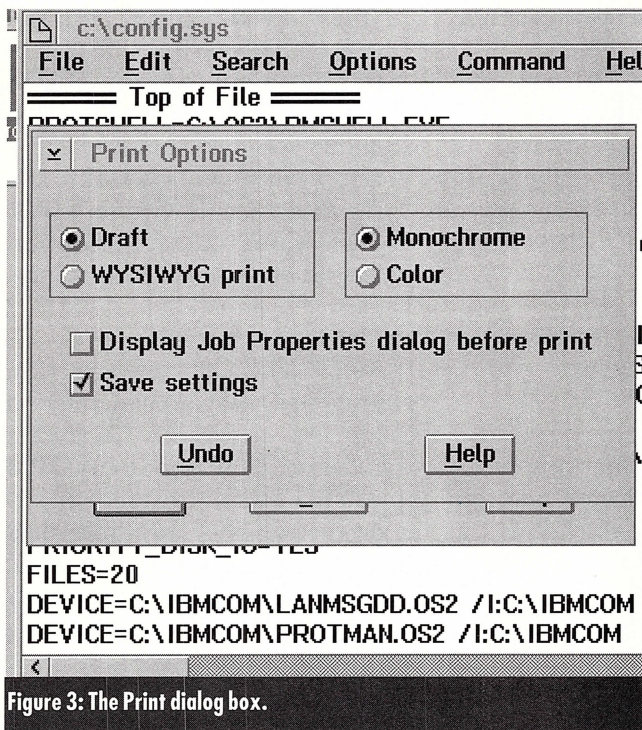
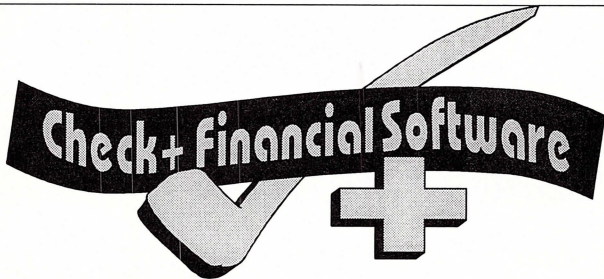


Figure 3: The Print dialog box.



CHECK WRITING SOFTWARE for OS/2

- + One Step Payment of Recurring Checks
- + Comprehensive Financial Reports
- + Easy Reconciliation of Bank Statements
- + Reminder of Due Dates for Bills
- + Unlimited Allocations for Checks and Deposits
- + Fully Graphical User Interface
- + Simple Budgeting
- + Extensive On-line Help
- + All for Just \$99

Computer Interface Corporation
 Call (800) 992-3428
 Fax (508) 651-8112
 5 Whittier Road, Natick MA 01760

New Release!

Performance 2.1 PLUS

Bonus 3000+ OS/2 Icons!

Tuning Kit
and
Utilities
for
OS/2 2.1





*Tap system resources, get **snappy** performance!
Utilities to simplify file maintenance & backup!*

100 Page Book and 40 REXX Programs

The Book - Best Source for OS/2 Tuning Information!
"Simple enough for the Novice with details to satisfy the Advanced user!"

The REXX Utilities - Simplify tuning, Improve Performance!
Utilities include: Optimizers to analyze and tune your system; Save disk space; Measure & report on tuning progress; Create OS/2 boot diskette; Backup your WorkPlace Desktop; Reset Icon Associations; Automatic simple file backup; Map disk & directory space; Commands to ease directory creation and deletion. All this AND 3000+ OS/2 Format Icons

All for ONLY \$39.95 + \$4.00 S&H

Performance 2.1 still available at \$29.95 + \$3.00 S&H

VISA, MC & Discover Accepted
 Send Check or M.O. or call
(203) 658-1204 - Fax (203) 651-0354
 CLEAR & SIMPLE, INC. - P.O. Box 130 - W. Simsbury, CT 06092

If you select Settings, you will be presented with the Settings notebook (Figure 5). Each of the notebook tabs enables you to change one of EPM's default behaviors:

- **Tabs** allows you to enter a number for the Tab interval. If, for example, you enter 12, the cursor will move 12 characters every time you press the <Tab> key.
- **Margins** allows you to set the left, right, and paragraph margins.
- **Colors** allows you to tweak the colors for the different components of the EPM interface. I normally prefer the default black-on-white colors, although when I'm feeling in a Darth Vader kind of mood, I reverse them for a sinister white-on-black effect.
- **Paths** lets you designate temporary and Autosave subdirectories.
- **Autosave** allows you to decide how many modifications (as determined the number of times the <Enter> key is pressed) can be made before EPM's Autosave feature kicks in and writes the

changes to a temporary Autosave file on disk. This feature can be handy if you live in an area where the weather causes power outages now and then.

- **Fonts** lets you set the default font and its associated attributes.
- **Keys**, while not as powerful as the macro concept we'll discuss later, allows you to override some of EPM's keystroke defaults.

To continue with the other Options/Preferences items:

- **Advanced Marking:** by default, EPM uses block-marking techniques. By enabling Advanced Marking, you are able to mark a block in four different ways: block marking, line marking, word marking, and character marking.
- **Stream Editing:** by default, EPM is set to line-editing mode: the text file is treated as a series of lines, and a carriage-return indicates the start of a new line. In Stream

mode, EPM essentially treats the file as a continuous stream of characters,

- with carriage-return treated as just another character.
- **Ring Enabled:** sooner or later, you will want to edit multiple files at the same time. Instead of starting up another copy of EPM to edit another file, Ring Enabled allows you to load multiple files into a "ring" and cycle through the ring to edit the various files.
- **Stack Commands:** this option enables stack-related commands.

Pushing the envelope

It seems to be a chronic affliction among OS/2 users in general, and EPM users specifically, to always want more. They want to use EPM to edit mainframe host files directly on the PC. They want to embed REXX macros. They want to add menu items and pull-downs. They want to add curly-brace checking for C code. The beauty of EPM is, if you're willing to do the work, you can customize it to do pretty much anything you can think of.

To understand how these capabilities are possible, you must realize that EPM sits on top of a very powerful programming language called E. For a long time, EPM was written in E, and anyone who masters the E language can soup up EPM in ways limited only by the

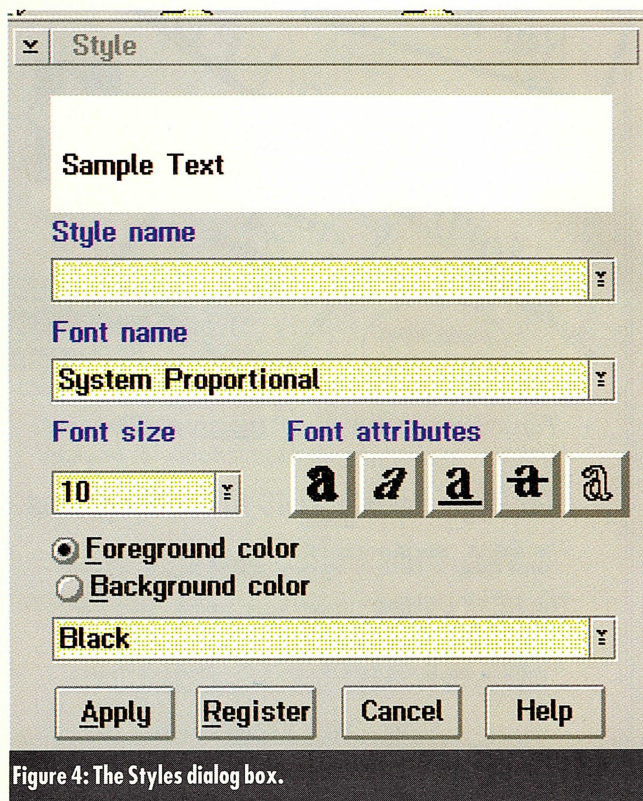


Figure 4: The Styles dialog box.

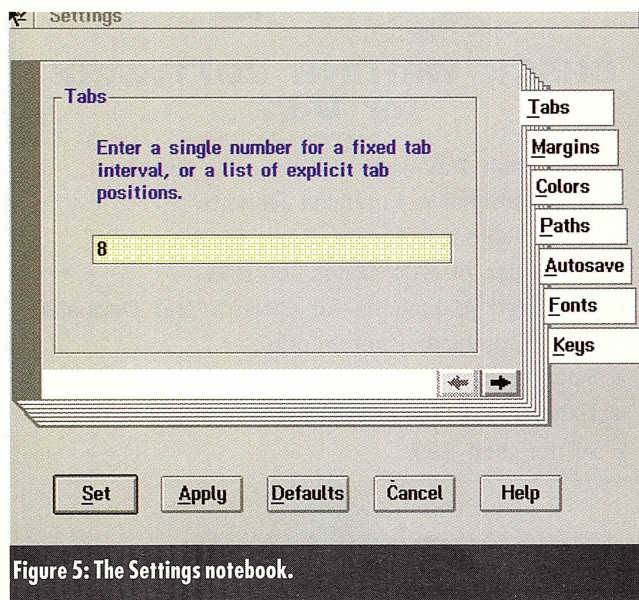


Figure 5: The Settings notebook.

imagination. Even if you lack the intestinal fortitude to tackle E, you can reap the benefits of those who have come before you and build an outstanding library of EPM add-ons, known as macros.

A discussion of the E programming language would require an article all to itself. *Epmbs.zip*, available on many bulletin boards, contains a technical reference document that can get you up to speed. Each macro is a text file with the extension .e, which is compiled with the "plain vanilla" EPM setup to create a new, customized version. The compiler tool is called ETPM, and is part of the *epmbbs.zip* package.

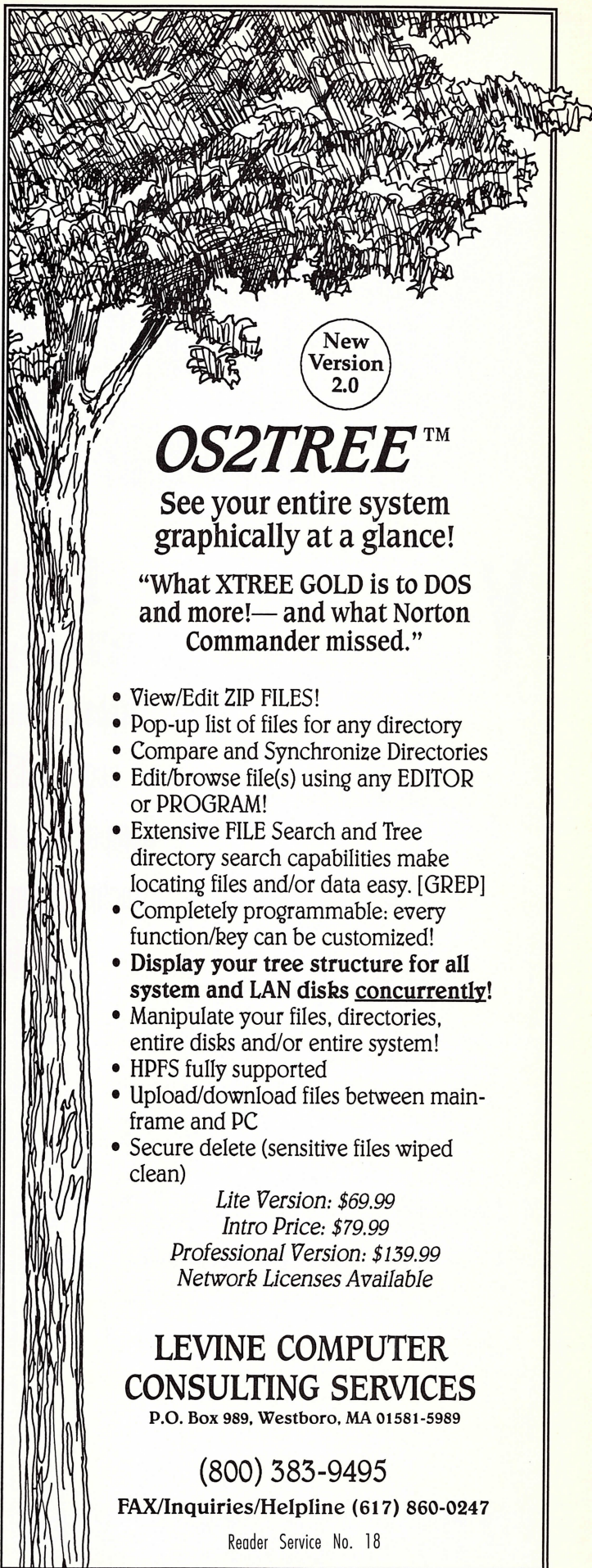
By now, you should be drooling at the thought of your very own personalized EPM, and you are probably wondering, "Where do I get this stuff and what is it called?" EPM-related files are available from several sources: IBM's TalkLink BBS, CompuServe's OS2SUP library 17, via anonymous FTP at *software.watson.ibm.com*, as well as various other local and national BBSs.

The files you want to download are *epmbbs.zip* and *ektbbs.zip*. *Epmbs.zip* contains not only the latest version of EPM, but a macro compiler and the source code for all the macros contained in the shipped version of EPM. (These macros are a great way to learn the E language by example.) You'll also find the *EPM User Guide* and *Macro Programmer Technical Reference*, PMMORE (a program for debugging EPM REXX macros), LAMPDQ, (a tool to execute commands on a VM host and have the output show up in an EPM window), EBOOKIE (which offers Book-master), GML, IPF support, and EPMASIST (which helps you add your own code-syntax macros and extensions to EPM). *Ektbbs.zip* contains the *E Toolkit Programmer Guide* as well as C source code for creating an EPM frame in a window.

It is important to emphasize that these add-ons are free, except of course for any on-line and telephone charges you incur in downloading them. Keep in mind, however, that these add-ons are provided "as-is," with the usual disclaimers. The programmers who actually designed EPM hang out on the E-EDITOR CFORUM on the TalkLink BBS, as well as on *comp.os.os2.programmer* on the Internet, so if you are in a jam, you can sound off in one of those places and someone should be able to help you.

Hopefully, I have given you enough of an idea of EPM's power to keep you interested and intrigued enough to plod ahead and become one of the growing number of EPM gurus who are using EPM for everything from writing code to creating detailed documents. As someone who has used EPM and its predecessors for almost a decade, I promise you there's a world of industrial-strength power in EPM if you are willing to go get it.

Steve Gallagher is part of IBM's RouteXpander/2 team in Research Triangle Park, N.C. He can be reached at *sgallagher@vnet.ibm.com*.



New
Version
2.0

OS2TREE™

See your entire system graphically at a glance!

"What XTREE GOLD is to DOS
and more!— and what Norton
Commander missed."

- View/Edit ZIP FILES!
- Pop-up list of files for any directory
- Compare and Synchronize Directories
- Edit/browse file(s) using any EDITOR or PROGRAM!
- Extensive FILE Search and Tree directory search capabilities make locating files and/or data easy. [GREP]
- Completely programmable: every function/key can be customized!
- **Display your tree structure for all system and LAN disks concurrently!**
- Manipulate your files, directories, entire disks and/or entire system!
- HPFS fully supported
- Upload/download files between main-frame and PC
- Secure delete (sensitive files wiped clean)

Lite Version: \$69.99

Intro Price: \$79.99

Professional Version: \$139.99

Network Licenses Available

LEVINE COMPUTER CONSULTING SERVICES

P.O. Box 989, Westboro, MA 01581-5989

(800) 383-9495

FAX/Inquiries/Helpline (617) 860-0247

Reader Service No. 18

Driver Downloads Made Simple

The easy way to find and retrieve files from on-line services. **By Esther Schindler**

You're ready to install a new piece of equipment—a CD-ROM drive, a faster video board, or a printer. But your copy of OS/2 (be it OS/2 2.1, OS/2 for Windows, or whatever) doesn't include the proper driver. When you call the manufacturer's Technical Support department for assistance, they tell you, "The OS/2 driver is available on our BBS," or "Download the driver from our forum on CompuServe."

What should you do? Well, first of all, don't panic. We'll guide you through the steps necessary to find and acquire OS/2 drivers on CompuServe and on a vendor's technical support electronic bulletin board. We're not going to explore the concept and benefits of bulletin-boards here; our pragmatic goal is simply to call a bulletin board, locate and retrieve drivers, then disconnect.

We'll assume that your OS/2 PC's modem is set up

Don't panic.

We'll guide you through the steps necessary to find and acquire OS/2 drivers on CompuServe and on a vendor's technical support electronic bulletin board.

and configured correctly, but you may have little experience using it. For consistency, this article uses the PM Terminal program included with OS/2. You'll find it in the Productivity Folder inside your OS/2 System Folder.

We haven't chosen Terminal because of its intuitiveness—far from it—but because it's the one tool that all OS/2 2.x users should have available. Unfortunately, Terminal is one of the least impressive features of OS/2. It's arcane, inconsistent with OS/2's own interface standards, and distinctly unfriendly. So, if you already own a native OS/2 communications pro-

gram, or if you have any level of comfort with a DOS or Windows communications program, feel free to use it instead.

Using the terminal program

Start Terminal by double-clicking on its icon in the Productivity folder. Terminal (also called SofTerm) will display a menu of predefined services. (See Figure 1.) It looks like they're already set up for you, but they really

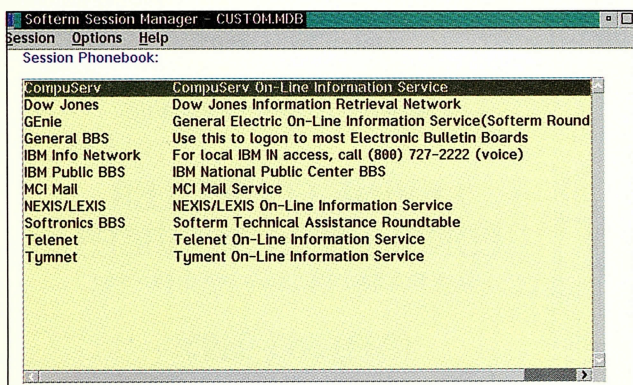


Figure 1: The Terminal main screen.

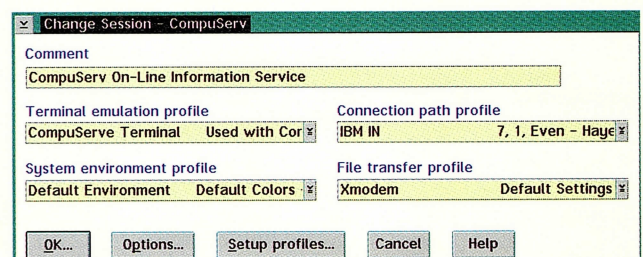


Figure 2: Changing the Terminal parameters for CompuServe.

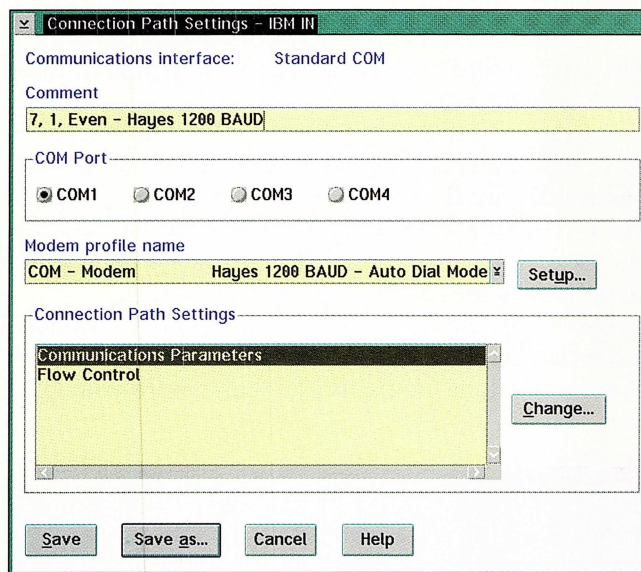


Figure 3: CompuServe requires that the settings be 7 Data Bits, Even Parity, 1 Stop bit. Fortunately, you don't have to understand what this means to get it to work.

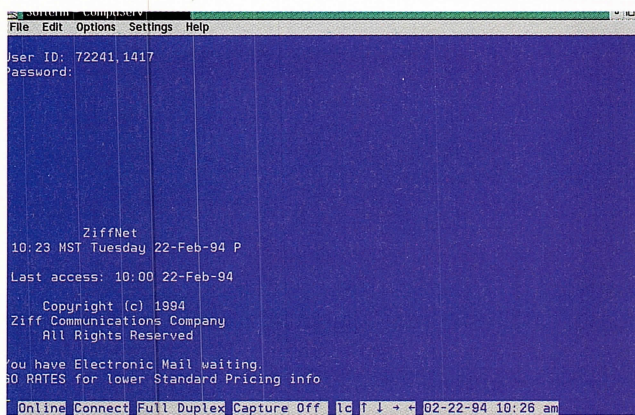


Figure 4: Logging into CompuServe.

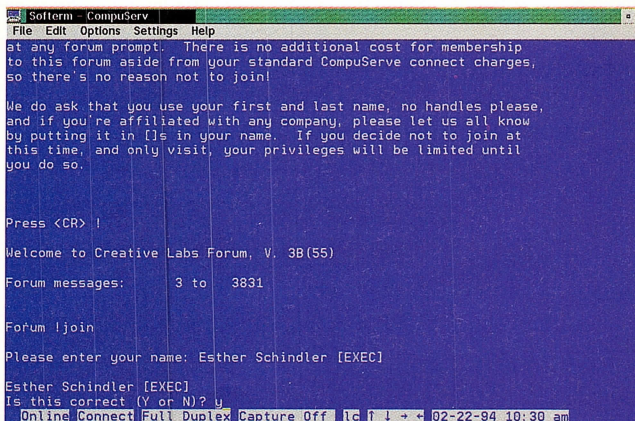


Figure 5: Joining a CompuServe forum.

aren't. You still need to tweak the settings a bit. (By the way, despite the instructions given here, expect to spend some time looking at the Terminal help screens.)

If the driver you need is on CompuServe and you aren't yet a member, call (800) 848-8990 (voice). You might already have a sign-up kit for CompuServe, however, as kits are included in the box with most hardware and software—including OS/2.

To set up Terminal for CompuServe, highlight CompuServe and choose Edit from the Session menu. Change the settings under Connection Path Profile to 7/Even/1, as shown in Figure 2. Unfortunately, Terminal's default modem speed set for that connection is 1,200 bits per second (the number of "bps" transferred is the measurement used for modem speed, and is slightly more accurate than the more commonly used "baud"). Your modem, even if it's fairly old, probably runs at a speed of at least 2,400 bps or, more likely, 9,600 or 14,400 bps. Change the Communications Parameters for the selected IBM IN and adjust the

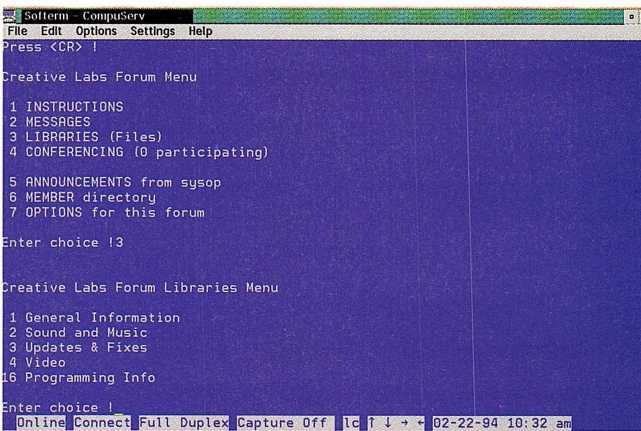


Figure 6: The Library menu in the Creative Labs (SOUNDBLASTER) forum.

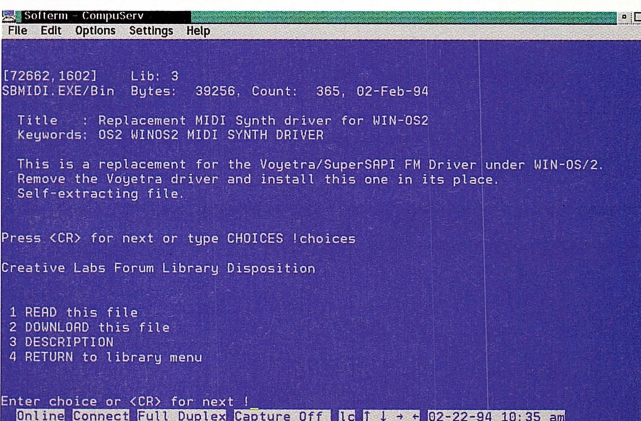


Figure 7: Selecting a file to download.

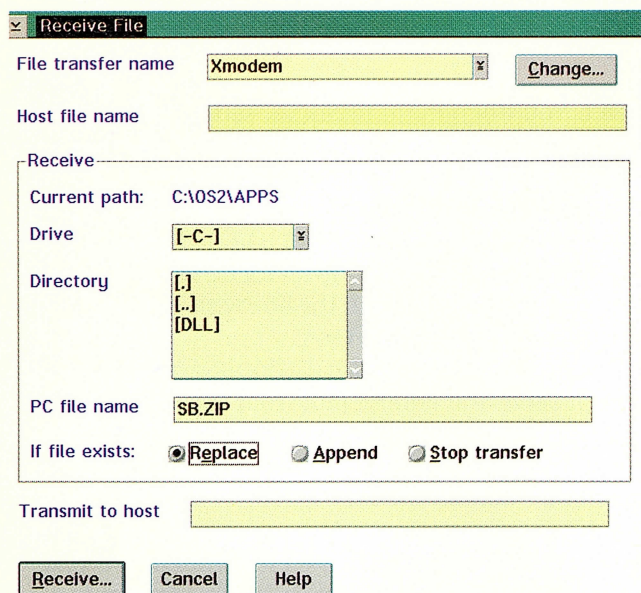


Figure 8: You have to tell Terminal what the file should be named on your local hard disk.

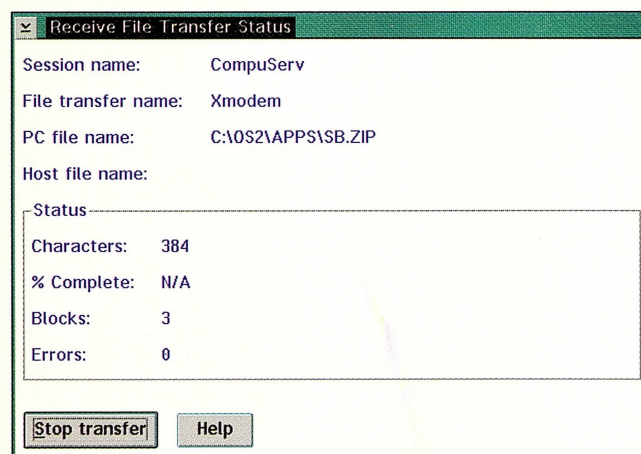


Figure 9: Terminal will show the status of the download during the file transfer.

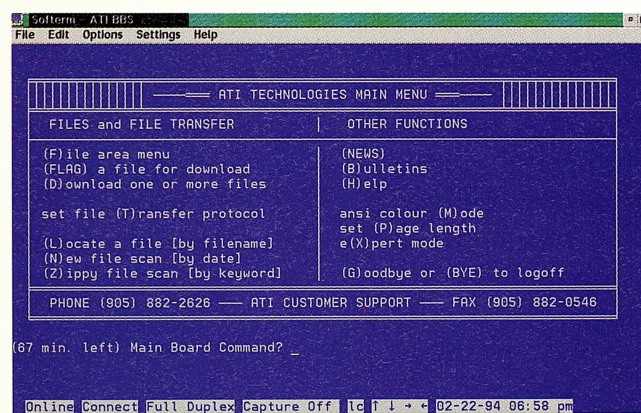


Figure 10: BBS menus all look very different, but nearly every one will have a File area.

modem speed to match your equipment, as shown in Figure 3. You will probably wish to save the parameters in a new file. (I called mine CompuServe at 14400.) After choosing OK... you type in the actual telephone number; you can find the local CompuServe phone number in your start-up kit.

Setting up to dial a new electronic bulletin-board service (BBS) is very similar. Choose New from the Session menu. Identify the service (such as "Vendor A's BBS"). The rest of the process is the same, except that for BBSs, choose 8/None/1 for the connection path profile. Make sure that you set your modem speed correctly.

Leave the default file-transfer protocol at XModem. A file-transfer protocol denotes the encoding that both communications programs use (that is, both your OS/2

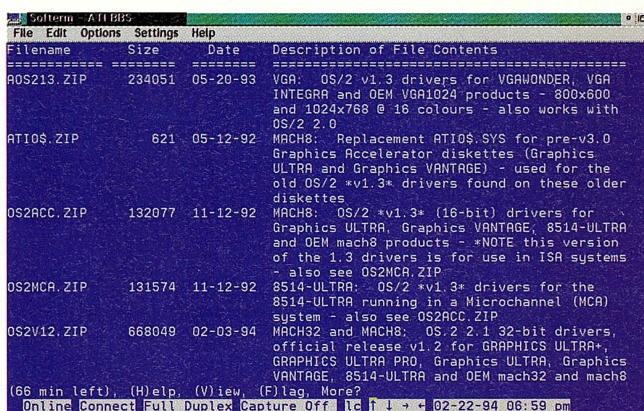


Figure 11: Selecting a file to download from a BBS.

software and the software controlling the bulletin-board) to transfer program and data files without error from one computer to another. XModem isn't the fastest way to transfer files, by far, but it's reliable and certain to be found on CompuServe and nearly any other service you dial into. (Nearly any book on telecommunications will discuss more technical information about file-transfer protocols.)

Finding a driver on CompuServe

To dial into CompuServe, double-click on the CompuServe entry or select Start from the Session menu. Terminal will dial the telephone and connect with CompuServe. Enter CIS as the service, then, when prompted, your ID and password. You'll see a log-in screen similar to the one in Figure 4, followed by a menu of choices and services.

Let's find an OS/2 driver for the Soundblaster card in the Creative Labs Forum. Assume that Creative Labs' technical-support representative gave you the exact name of their forum: Blaster. (Many OS/2 drivers can be found on the OS2SUPP and OS2AVEN forums, by

Do you want more support in your day-to-day use of OS/2? Is your company struggling to integrate OS/2 into its enterprise computing strategy? Do you want to take OS/2 to a higher level?

OS/2 WORLD WILL POINT YOU IN THE RIGHT DIRECTION

The independent technical program, featuring over 100 lectures, workshops and tutorials, will present you with the objective truth — both good and bad — about OS/2, IBM, and third-party providers. You can count on the information because our top-notch faculty won't have a hidden agenda. More importantly, the technical program is geared to you, the OS/2 customer, not the industry.

The technical program is broken out into 8 dynamic tracks:

- Enterprise-Wide Networking
- Client/Server and Information Management
- Local Area Networking
- Power Computing
- Systems Administration
- Corporate Software Development
- Personal Programming
- Multimedia

AN OBJECTIVE AND BALANCED FACULTY

Classes will be taught almost exclusively by independent expert users, consultants, and trainers offering objective and balanced information to users and managers charged with deploying and maintaining OS/2 systems in corporate environments. Instructors will be experts who work with OS/2 in the field, and have implemented OS/2 solutions for their companies or clients.

INDUSTRY-WIDE SPONSORSHIP GUARANTEES A TOP QUALITY EVENT

Produced by Miller Freeman, Inc., the third largest trade show producer in North America, the OS/2 World Conference & Exhibition is presented in cooperation with the IBM Corporation and sponsored by *OS/2 Magazine*, *OS/2 Developer*, *DBMS*, *Database Programming and Design*, *LAN Magazine*, *STACKS: The Network Journal*, *Software Development* and *Dr. Dobb's Journal*.



July 19-22, 1994

**Santa Clara
Convention Center
Santa Clara, California**

CHOOSING THE RIGHT NEW PRODUCTS CAN BE QUITE A BALANCING ACT

The OS/2 World Products Exhibition is the only place you can get a hands-on look at the hardware and software that can make your system scream. You can pose your toughest questions as you meet face-to-face with the major players in the industry. This world-class exhibition will feature leading suppliers showcasing applications software, communications hardware and software, databases, network solutions, utilities, multimedia tools, and more. The exhibition will run Tuesday, Wednesday and Thursday so you will have plenty of time to get the answers you need.

SEE THE FUTURE OF OS/2 TODAY

Running parallel to the technical program will be dozens of presentations by key visionaries at IBM and major hardware and software providers. Topics include: OS/2 and Workplace OS, What It All Means To You • Customizing the Workplace Shell with REXX • Exploiting OS/2 Software Motion Video • Introduction To The OSE Distributed Computing Environment • And More.

Don't miss this opportunity to learn what applications and opportunities await OS/2 users of the future, and how you can stay on the cutting edge.

Phone, FAX or mail today for more information on the OS/2 World Conference & Exhibition.



YES! Please send me info on: ☐ Attending ☐ Exhibiting

NAME _____

TITLE _____

PHONE _____

COMPANY _____

FAX _____

ADDRESS _____

CITY _____

STATE/PROV. _____

ZIP CODE _____

OS/2 World Conference & Exhibition Attn: JulieAnn Lee
600 Harrison Street, 4th Floor, San Francisco, CA 94107-9603
Phone: (415) 905-2354 Fax: (415) 905-2220

OMOS1

the way.) The next step is to access the forum by typing "Go blaster" and CompuServe will take you right there. You'll see an introductory announcement, describing the forum's purpose.

(If you don't know the forum name, type "Go forums" and wind your way through the menus until you find the right one. Or type "Find [subject]," such as "Find ATI" or "Find video;" CompuServe will give you a list of the most likely suspects to investigate. You can also always guess—most of the forums are named with some small semblance of sanity. For example, "Go ATI" will go to the forum that supports ATI video cards. In most cases, it's probably quickest to find the name of the CompuServe forum in your hardware's owner's manual, or ask the vendor's tech-support department for the forum name.)

Before you can use the forum's

services, you need to join the forum. Type Join. CompuServe will prompt you to type your name, as shown in Figure 5. You'll see a menu of options, including Messages, Libraries, and Conferencing. At this time, you want to transfer a file from CompuServe to your computer; program and data files are stored in libraries, of which there are several in each CompuServe forum. So, choose Libraries, and select the one that seems most relevant (see Figure 6). In some cases, the tech-support representative will have told you in which library the driver resides.

If the tech-support rep was efficient, you were told the exact file name to look for. In that case, you can select Download and transfer the file from here. (Downloading is the process of copying a file from the remote site—the BBS or CompuServe—to your own com-

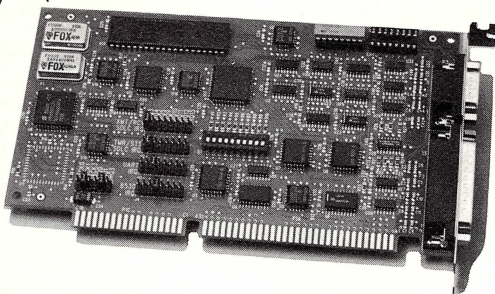
puter.) However, let's assume that you don't know the exact name. Choose Browse and, when prompted for a key word, supply one that makes sense: "OS/2" or "Driver" is a good guess, as is the model name of the product you're using (8514a or Horizon). Leave the age field blank by pressing <Enter>. (You might have to go through this process several times, before you find what you're looking for. It can be frustrating now, but you'll get better with practice.)

CompuServe will display a list of files that match your key words, one at a time. When you find the one you want, type Choices and then choose Download, as shown in Figure 7. Choose XModem as the file-transfer protocol, since that's what we defined in Terminal. CompuServe will tell you when to tell your communications program to start the download. When it



64000

bps



Digital Services Adapter

Designed for high-speed OS/2® Communications Manager/2 SDLC connectivity using digital services (e.g., Switched 56, ISDN), the DSA cables to DSU/CSUs and ISDN TAs via V.35 or RS-232. Supports inband and outband "AT" command auto-dialing. Available in ISA and MCA versions.

For more information call (800) 444-1982 or (512) 345-7791

MICROGATE®

All trademarks or brand names are the property of their respective owners.

32-Bit Editing Power!

Tritus SPF™

The OS/2 Text Editor that Brings the Power of the Mainframe to the PC!

Compatibility. Tritus SPF emulates ISPF/PDF including modifiable panels and keyboards. Plus, it supports many additional features such as Undo/Redo and highlighting. Tritus SPF is available for OS/2, DOS, and now for UNIX (IBM's AIX on RS/6000 machines).

REXX Macros. Write your own edit primary commands utilizing IBM's REXX in OS/2 or AIX and Tritus REXX in DOS. Tritus REXX and our ISREDIT superset of over 95 commands is included with the package. A REXX language book is optional.

Great product, I'm looking forward to version 2.0!
 - Dale Stroyick, BMC Software

Great Deal. Tritus SPF is only \$195 which includes the DOS and OS/2 versions. Call for AIX pricing. Our sales Department can be reached toll-free at **1-800-321-2100**.

TRITUS

6034 W. Courtyard Drive, Suite 120
 Austin, Texas 78730-5014 USA
 (512) 794-5800, Fax (512) 794-3833

does, choose Receive File... from Terminal's File menu. Terminal will display a dialog that looks like Figure 8; type in the name of the file you're downloading where it says PC File Name. Terminal will provide a status report during the download, as shown in Figure 9.

When the file transfer finishes—hey, you're done! You can type Off to disconnect from CompuServe. For good measure, choose Hang Up from the File menu. (I've found Terminal to be a little lazy about hanging up the phone.)

CompuServe can be an overwhelming place, especially with as wimpy a telecommunications tool as Terminal. You can do much more on CompuServe than downloading drivers. Many special-purpose telecommunications programs are designed to work with CompuServe, and all will make CompuServe easier and more satisfying to use. Currently, there's only one written for OS/2; it's called Golden CommPass, from Creative Systems Programming (see "Test Drives," by Brian Proffit, OS/2 Magazine, February 1994, pp. 21-29, for a review of Golden CommPass—ed).

Finding a driver on a BBS

The general process of dialing into a BBS is similar to dialing CompuServe. You define the settings for the BBS in Terminal (remembering that BBSs need 8/None/1 instead of the CompuServe 7/Even/1) and set the file protocol to XModem. Instruct Terminal to dial the BBS by double-clicking on the BBS name you defined.

You will have to join the BBS, since you're new in that electronic neighborhood. Joining a BBS is more complex than joining a CompuServe forum. You will be asked to supply your name and address (and often other information) so that the company has a

record of you and your call. (After the first visit, it will be much easier to visit this particular BBS. You won't have to supply the sign-up information again, unless you don't come back for a very long time.) But, on the other hand, BBSs are usually free to use.

CompuServe may not have the most aesthetic interface in the

known universe, but at least it's consistent. Most BBSs, on the other hand, have customized their menus so that each new BBS seems like a whole new world, as shown in Figure 10.

To find a file on a BBS, look for the area called Files or Library. You can usually choose an OS/2 section from the files available, as shown in

VNR KNOWS CLIENT/ SERVER



Ask for these and other VNR titles at your local bookstore.

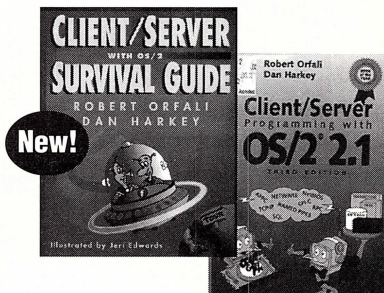
Van Nostrand Reinhold

115 Fifth Avenue, New York, New York 10003

1-800-544-0550 73373.64 @compuserve.com

OS/2® is a registered trademark of the IBM Corporation.

Read these two important books
from bestselling authors
Robert Orfali and Dan Harkey...



Client/Server Survival Guide with OS/2®

Provides a sweeping tour of client/server and distributed objects. An easy-to-follow guide that comprehensively reviews the technology, standards and over fifty commercial OS/2 client/server products. Offers 969 pages of essential information plus 400 illustrations. \$39.95 0-442-01798-7 IBM #SR28-5494

Client/Server Programming with OS/2® 2.1, 3/E

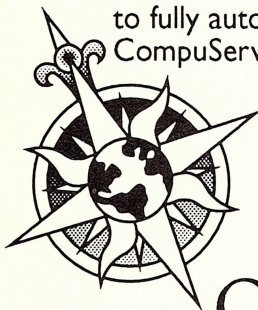
The Second Edition won "The OS/2® Book of the Year" from OS/2® MONTHLY. Readers said individual chapters were, by themselves, worth the price of the book. And they're right! This new 1,142-page edition is a *must have* for all client/server and OS/2 programmers. \$39.95 0-442-01833-9 IBM #G325-0650-02

Get the Connection!

⚡ CompuServe® gives you access to the world's largest personal information and communication service.

⚡ OS/2® gives you an operating system with unequalled versatility and reliability.

Reap the rewards of what these two can do together with Golden CommPass™, the only OS/2 software to fully automate your on-line sessions with CompuServe forums, libraries, weather and mail.



CompuServe links you to the vast and exciting realm of on-line communication.

Golden CommPass guides you through with unprecedented ease and productivity.

Golden CommPass™



Creative Systems Programming Corp.
P.O. Box 961 Mt. Laurel, NJ 08054 USA
(609) 234-1500 Fax (609) 234-1920
Internet: 71511.151@CompuServe.com



Reader Service No. 23

OS/2 MARKETERS!

Time is running out to reserve your exhibit space for the OS/2 World Conference & Exhibition!

Don't miss this opportunity to reach over 3,500 OS/2 buyers.

For a look at what space is still available, call Maryann Kearns at 415/905-4927.

For information on only attending the show, call 415/905-4994.



CONFERENCE & EXHIBITION

JULY 19-22, 1994
SANTA CLARA CONVENTION
CENTER, SANTA CLARA, CA



Figure 11, and list the files. Choose the file(s) you want to download, then select Download from the BBS's menu. The rest of the downloading process is nearly identical to the download instructions for CompuServe, although you'll need to read the menus closely. To log off the BBS, you usually type G for Goodbye.

Now what?

You have successfully downloaded the file you need to support that cool hardware. You're all set, right? Well, not exactly.

Most files are stored on BBSs in compressed or .zip form (for example, *stbdrv.zip*). Files are compressed to save space, and to group together related files in one manageable package. You need to use a utility program to decompress the zipped file into the several separate files; if you don't have one, you should be able to find one on the bulletin-board or on CompuServe. (see "Test Drives," by Brian Proffit, OS/2 Magazine, March 1994, pp. 15-27, for a review of compression utilities—ed) One of the files in the compressed file will be a text file with a name like *read.me* or *readme.doc*; it will contain the explicit instructions to incorporate the driver in your OS/2 system. The compressed file will also contain one or more driver files, often for different models of the peripheral in question; be sure you read the instructions carefully, to make sure you use the correct driver.

Esther Schindler is a computer consultant and writer. She is a contributing editor to OS/2 Magazine, sysop (systems operator) of the ZiffNet Executives On-Line forum on CompuServe, and author of The New Riders Guide to Modems. You can reach her on CompuServe at 72241,1417.

Making it up in Volume

Rolling out OS/2 using the CID Methodology by Rob Coventry

You've convinced management to go ahead with rolling out OS/2 2.1 within your workgroup, department, or maybe even your company. Great! The next thing you know, you've "volunteered" for an installation schedule no human could possibly meet. You need to install OS/2 2.1 (25 diskettes), Communications Manager/2 1.1 (eight diskettes), LAN Requester 3.0 (three diskettes), LAN Adapter Protocol Support (one diskette), maybe the NetWare Requester, and an assortment of business applications. If you only had to install this stuff on a couple of computers, it wouldn't be so bad. However, you look at your dozen or more potential installations and that stack of diskettes and ask yourself, "How am I going to do this?"

What are the alternatives?

OS/2 can be installed from CD-ROM or floppy diskette. Let's call this the *standard* method. If you have a network, you have a couple of other alternatives: replication/cloning, redirection, and configuration, installation, and distribution (CID).

The standard installation method involves installing software from diskettes. Many diskettes must be installed, dozens of questions must be answered, and the answers aren't necessarily simple. If you only have to install the software on a few machines or you don't have a network, standard installation may be your best method. If you have CD-ROM drives on your PCs, the CD-ROM version of OS/2 installs in about half the time of the multiple-diskette package.

You could also clone or replicate an OS/2 machine. Install OS/2 on a model machine. Then, use a tool to clone your model onto a target machine. If all the PC hardware is identical, this process may suit you well. But if you have many different hardware types or

installation scenarios, you may want to look at another alternative.

Redirected installation exploits the use of media other than diskettes to install software. CD-ROM is one example of redirected installation. The use of a network drive expands the redirected installation to multiple users connected to a network. This process involves copying the product diskettes onto a computer called a code server. The code server is attached to the network. From a workstation, you connect to the code server with a modified version of the OS/2 boot diskettes. Once you have connected to the code server, the installation proceeds like a standard floppy installation.

For those of us who have a large number of machines to install software on, even the improved performance that redirected installation provides takes more time than we'd like. With redirected installation, the questions have to be answered every time. Since there are so many questions to answer, you are likely to make mistakes. What you'd like to have is an automated method for installation. Enter configuration, installation, and distribution (CID).

Similar to redirected installation, CID involves copying installation diskettes to a code server and connecting to the network. The primary difference between redirected installation and CID is the ability to store the answers to all those pesky questions in a text file called a response file. The CID process then reads the answers stored in the response file at run time. The primary advantages to the CID process are consistency and performance. Since you can store the answers to all the installation questions in a text file, you can build standard response files and ensure that all the software is installed on your machines in the same way. The installation process is automated, so you can install software on more than one machine at

a time without having a person at each workstation.

Be aware that the CID process is not perfect. Each CID-enabled product provides you with a way to create response files, however, the method can vary. Still, if you have to install software on a large number of machines, CID may be the best option for you.

How many machines are considered a "large number?" I usually recommend CID to anyone who maintains 75 or more machines. Understand that there are exceptions to the rule. For example, if you maintain a set of machines that must be installed identically and stay in production 24 hours a day, you have a small time window for maintenance. CID is an ideal method for handling short maintenance schedules and consistent installs.

What is CID?

CID is a process, not a product, that provides you with a way to install OS/2, OS/2 applications, and even some DOS applications. CID allows you to install across local-area networks (LANs) and wide-area networks (WANs) using standard network protocols.

In a CID environment, software installation diskettes are copied onto the hard diskette of a code server along with a CID management product that enables the code server to use the network to install software. Response files are created and stored on the code server. Finally, a modified version of OS/2 boot diskettes are used to connect the target machine to the code server for the installation.

The primary objectives of the CID process are to address the problems facing an administrator installing OS/2 software on a number of computers: eliminate diskette handling and user involvement, and optimize administrative involvement. Once the CID process is set up and tested, running the

CID installation is quite simple. CID's goal is accomplished through the use of a few key elements: response files, product images, and procedures that control the installations. The primary platform for CID is a LAN that supports NetBIOS, and that's what this article addresses.

Hardware environment

Before we cover the products, let's define the hardware requirements. A typical code server should have a large hard drive to support all the product images, response files, and log files. You will also need a high-performance network adapter to provide the best possible delivery to your target machines. Although the process is primarily I/O intensive, you will want a 486 or better processor. I usually recommend a 400MB hard drive on a 486 with at least 16MB RAM and a BusMaster Token Ring card or Ethernet card.

Does this machine need to be a dedicated server? That depends on how often you plan to perform installation (include development and test time in this calculation). This question is tough and really depends on your environment. If you are supporting a network of 100 or more machines, you will probably want to have a dedicated code server because it will be busy running installations, updates, migrations, and configurations.

What products are available?

It's important to understand the difference between CID products and CID-enabled products. A CID product is an application that provides the platform to install OS/2 software via CID. CID-enabled products are applications that can be installed using the CID process.

In the LAN environment, IBM provides two products for CID installation: Network Transport Services/2 (NTS/2) and Netview Distribution Manager/2 (NvDM/2). IBM also provides an "add-on" tool

called LAN Automated Distribution/2 (LAD/2) that can be used to front-end either NTS/2 or NvDM/2.

To push or to pull

When deciding which product to select for your environment, you have to decide how you want to control the installation process. If you initiate the installation from a central location, you are *pushing* the installation to the target machines. When you initiate the installation from the target workstation, you are *pulling* the product. The essence of push and pull gets down to whether you attend the installation. In the pull environment, someone must attend each installation; in the push environment, you can perform unattended installations. NTS/2 is a pull product. NvDM/2 is a push product. LAD/2 can be used with NTS/2 or NvDM/2.

NTS/2 and NvDM/2 are both sold separately. NTS/2 is also included with LAN Server 3.0. It is easiest to think of these CID products as "thin" versions of LAN Server and LAN Requester. LAN Server is not required for NTS/2 or NvDM/2 to install your software using CID. Each product has a NETBIOS file server application that runs on a code server and a NETBIOS client that talks to the server.

Using NTS/2 involves writing REXX scripts for each installation procedure you must perform. A number of sample scripts are provided with the application, but changing them requires a good background in REXX. Since NTS/2 is a pull product, you must supervise each product installation or upgrade. These disadvantages conflict with two primary objectives of CID—reducing end-user involvement and administrative tasks. NTS/2; however, is somewhat inexpensive. You have to weigh the product costs against administrative costs.

LAD/2 was originally written to

address the problems of developing the REXX scripts required for the NTS/2 environment. LAD/2 provides a REXX code generator designed specifically for the NTS/2 environment. LAD/2 adds the ability to generate response files in a manner you are more familiar with—emulating the product installation dialogs. LAD/2 also provides the ability to support non-CID-enabled product installations as well as DOS and Windows applications.

NvDM/2 replaces the NTS/2 REXX scripts that control the

installation procedures with simple instruction profiles. The NvDM/2 profile contains the command line that you would type if you were to run the CID installation manually. NvDM/2 can control the installation of up to 100 machines simultaneously from one NvDM/2 computer and can support the definition of up to 1,000 users. NvDM/2 is the only product that extends CID beyond the LAN environment to a WAN environment and can be used to schedule installations. At the end of each installation, NvDM/2 stores the installation information in a DB2/2 database and prevents you from accidentally installing the same software twice. This database can be used for a number of post installation system-management processes. NvDM/2 also provides a method to handle locked system files for applying fixes and incremental updates.

NvDM/2's biggest disadvantage is its poor front end. In 1994, LAD/2 was enabled to provide front-end support to NvDM/2. You can use LAD/2 to create response files and control your NvDM/2 environment.

CID enabling software

Two key capabilities are required for a product to be CID enabled: redirected installation and response-file support. Six general requirements must be met to CID enable software:

- Storage of product diskettes on the code server
- Support and generation of response-files
- Support for any network drive (redirected)
- Return code support to the CID product
- Command-line parameter support
- Progress information

A CID-enabled product has a modified *install.exe*, which can be run across the network and will read

response files. The product vendor must also provide you with the ability to store the installation diskettes (product images) on the code server. Command-line parameters are used to tell the installation program things like where the product images are located and the name of the response file. Return codes are used to report the status of the installation to the CID product. CID products provide an automated method to reboot during an installation and return codes are most often used to communicate the need for a reboot.

How to install OS/2 2.1 using CID

The first step in any CID installation is to create response files. To get a feel for the options that will be presented in the response file, start by manually installing OS/2 (or the appropriate software) a couple times using different answers to the installation questions. Each product has a different method for creating response files. OS/2 creates response files as a byproduct of a manual installation procedure. LAPS and CM/2 have programs that create response files from running configured code. DB2/2 and LAN Server provide dialog-driven response-file creation. Each procedure is lacking in one way or another, which is why LAD/2 is appealing to many people.

Response files

To create a response file for OS/2, simply run your normal installation. The OS/2 installation program creates a response file called *user.rsp*, which is stored in *\os2\install* on your boot drive. *Sample.rsp* is also stored in *\os2\install*. Remember that a response file is a text file that contains all the answers to the installation questions for a given product. Each installation question represents a keyword in the response file. The answers to the questions are

Listing 1: *User.rsp*.

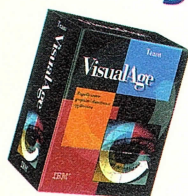
```
AlternateAdapter=0
APM=1
BaseFileSystem=2
CDROM=6
SCSI=
CountryCode=001
CountryKeyboard=US
DefaultPrinter=132
DiagnosticAids=1
DisplayAdapter=0
Documentation=2,4
DOSSupport=1
WIN-OS/2Support=1
DPMI=1
ExitOnError=0
Fonts=1
FormatPartition=1
MigrateConfigFiles=0
MoreBitmaps=1
Mouse=1
MousePort=0
OptionalFileSystem=1
OptionalSystemUtilities=1
PCMCIA=1
PrimaryCodePage=1
PrinterPort=1
ProcessEnvironment=1
ProgressIndication=1
RebootRequired=0
REXX=1
SerialDeviceSupport=1
SourcePath=A:
TargetDrive=C:
ToolsAndGames=2,4
```


INDELIBLE

THE NEXT GENERATION

UTILITIES

VisualAge

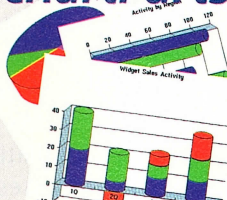


by IBM Corporation

\$1,625.00

Break the code barrier with VisualAge! A powerful new vision of programming. Break the barrier. Extend the boundaries. Free yourself from the limits of what procedural programming can accomplish. Get out of the code mode and into the VisualAge. Rapidly develop industrial-strength, object-oriented client/server applications breaks through with VisualAge, IBM's powerful new object-oriented visual programming tool
87G7044 MSRP \$2,495.00 **SAVE \$870.00**
CANADA **CALL**

chartParts™



by Dakota Technologies

\$209.00

Add stunning color business graphics to your VisualAge applications ... without a line of code! ChartParts is an easy-to-use tool for translating flat data into exciting color 2D and 3D graphs. Use chartParts to add business graphics to any application developed with or supported by VisualAge. Fully customizable and object oriented, chartParts will help you develop applications faster and easier than ever!

DAK25 MSRP \$249.00 **SAVE \$40.00**
CANADA **CALL**

MicroLearn Game Pack 1 by MicroLearn Nordic

Put some fun in the WorkPlace Shell with this 10-game pack. Included are Block Bouncer, Combo, MindSweeper - 7 more.
MLN16 MSRP \$39.95 \$39.95
CANADA \$54.00

FaxWorks for OS/2



by SofNet

\$99.00

True OS/2 fax software that's flexible, fast and easy. FaxWorks OS/2 enables faxing from OS/2, Windows or DOS applications, giving you total flexibility, no matter what application you're running! Features PCL support, phonebooks, annotation, broadcast, and options for multichannel support and OCR. ThinkPad Proven®. Paperless fax capability unmatched by any other fax software product.
(Single user pack).

SFN 13 MSRP \$149.00 **SAVE \$50.00**
CANADA \$159.00

SpaceMap 1.1

by Capstone Software

32-bit PM utility for overcrowded disk drives and LANs. Summarize directories, search, list, copy, move, erase files & directories.

CAP11 MSRP \$59.95 \$49.00
CANADA **CALL**

The J&J Utilities for OS/2 by J&J Computer Consulting

Over 20 PM & command line utilities, including job scheduling, disk maintenance, defrag, job control, file searches and more.

JJC83 MSRP \$49.95 \$39.00
CANADA **CALL**

ZIPMAN

by Software Builders

ZIPMAN is a full featured OS/2 interface to PKZip/PKUnzip. Just point & click, drop & drag to decompress & backup files.

SWB10 MSRP \$39.95 \$32.00
CANADA \$45.00

Cursor Power

by North Shore Systems

Make your point with Cursor Power! Customize and convert your OS/2 Pointer, Wait, Text, I-Beam cursors ... and more.

NSS20 MSRP \$49.95 \$39.00
CANADA \$62.00

BackMaster

by MSR Development

BackMaster for OS/2 supports QIC 40/80 tape drives connected through the floppy drive controller. Supports HPFS & FAT.

MSR77 MSRP \$79.95 \$59.00
CANADA \$82.00

ChipChat Wireless Communicator by ChipChat - Cawthon

Send text messages to alpha pagers quickly, conveniently & easily with this new 32-bit OS/2 WPS app. Uses IBM SOM technology.
CAW45 MSRP \$79.00 \$59.00
CANADA \$82.00

COMMUNICATIONS

GRAPHICS

PRODUCTIVITY

ORDERS:

US: 1-800-776-8284

CANADA: 1-800-672-4255

OS/2 AND IBM ARE REGISTERED TRADEMARKS OF IBM CORPORATION. ALL OTHER REGISTERED TRADEMARKS BELONG TO THEIR RESPECTIVE OWNERS.

THE SINGLE SOURCE FOR OS/2[®]

INDIVIDUALS OF SOFTWARE

NETWORKING PROGRAMMING

PMComm

by MultiNet Communications

PMComm is a 32-bit PM communications program. Ten file transfer protocols & REXX scripting are two most popular features.

MNC20 MSRP \$99.00 \$79.00
CANADA \$109.00

MEDIAscript OS/2 Desktop Edition



by Network Technologies

MEDIAscript defines the state of the art in multimedia authoring tools. Its visual programming environment and full support for MMPM/2, DVI, Ultimotion software video and FLI animation in OS/2 make it unique. Its power makes it capable of creating all classes of multimedia applications. It is part of an upwardly compatible family of products for multimedia developers and publishers. Now includes Video Editor!

NET25 MSRP \$895.00 SAVE \$97.00
CANADA \$963.00

PrntScr

by MITNOR Software

4 integrated utilities provide screen capture (save to file or printer), color mapping of B&W images, clipboard and screen saver.

MIT15 MSRP \$450.00 \$99.00
CANADA \$137.00

Power Translator Professional



by Globalink

Fast, accurate and customizable, Power Translator Professional is the foreign language translator of choice. Business is increasingly conducted internationally, and while English may be considered the international language of business, most people prefer correspondence in their own language. Choose Spanish, French, or German. Order now and get a FREE copy of Star Trek - the 25th Anniversary game - while inventory lasts.

GLB11 MSRP \$1,195.00 SAVE \$946.00
CANADA \$656.00

SQL Objects

by Objects ++

A powerful collection of object-oriented database classes that provide full access to SQL and non-SQL databases.

GS190 (FOR IBM C++) MSRP \$699.00 \$495.00
GS192 (FOR BORLAND C++) \$495.00

Applause

by Solution Technology, Inc.

Finally! An image viewing utility that is both fast and useful. Twain enabled, Applause supports both HP and Logitech scanners.

SLT25 (HP) MSRP \$499.00 \$155.00
SLT38 (LT) MSRP \$449.00 \$115.00

BakupWiz



by PCX - The PC Experts

OS/2 BakupWiz is the Software Solution for SCSI tape backup for OS/2. Supported backup devices include all SCSI-1 and SCSI-2 tape drives as well as other hard drives, file servers, Bernoulli, Syquest, & magneto optical. Full support for EA's, long file names, and networking is included. OS/2 BakupWiz can FULLY restore the OS/2 system partition from a floppy boot disk. Compatible with PCX's DOS BakupWiz.

PCX55 MSRP \$149.00 SAVE \$50.00
CANADA \$137.00

Relish

by Sundial Systems

Calendar, Phone Book, To Do List: primed for flexible convenient use with SOM objects, drag-drop, type-to-search, and more.

SUN10 MSRP \$189.00 \$89.00
CANADA \$125.00

WipeOut

by BocaSoft

This is sample text to indicate the size, style and amount of copy which will fit in this space, to advertise your OS/2 application.

ABC123 MSRP \$149.00 \$99.00
CANADA \$123.00

THE *Single* SOURCE FOR OS/2[®]

"Founded by Dedicated OS/2 Users For OS/2 Users"
Call for our new catalog - hundreds of OS/2 products!



represented by the values of the keywords. Together, these are called keyword pairs. *User.rsp* contains all the keyword pairs you selected in addition to some defaults. *Sample.rsp* contains nearly all the keyword pairs that can be used in an OS/2 installation. Notice that in *sample.rsp*, comments can be entered by starting a line with an asterisk. Asterisks are commonly used in all CID-enabled applications for comments. I recommend using comments to internally document your response files so you will understand your selections later. For detailed descriptions of an OS/2 response file refer to the IBM RedBook, *Automated Installation for CID Enabled OS/2 V2.x* (Document Number GG24-3783-01).

I ran a manual installation to create *user.rsp*. During that installation, I chose FAT as my primary file system. You will see that the keyword **BaseFileSystem** is set to two (**BaseFileSystem=2**). If you look at the *sample.rsp* created by your machine, you will see that the value two means you want to use FAT to format the installation partition. I also told the installation program to format my installation partition (**FormatPartition=1**). It's quite difficult to memorize what all the values mean, so you can see the value for comments inside your response files as used in *sample.rsp*.

Once you are satisfied with the values in your response file, you only have one step before it can be used in a CID environment. In *user.rsp*, you'll see the statement **ExitOnError=0**. The CID installation won't work unless you change it to **ExitOnError=1**. This statement tells the OS/2 installation program that you are running a CID installation as opposed to a redirected installation. Finally, **SourcePath** is set to A:. You should remark this keyword out. If you leave **SourcePath=A:**, the CID process will look for the product

images on your disk drive.

User exits can be used to perform a number of tasks during the installation. With OS/2, the **UserExit** keyword is performed after the product is installed but prior to a reboot. So, the system is completely installed and "unlocked." I use **UserExit** to apply fixes, perform cleanups, and so on. I use user exits to apply the shutdown fix for OS/2 2.1.

Creating the OS/2 image

OS/2 provides a program called *seimage.exe* to create the product image on your code server. First, you have to "unpack" *seimage.exe* from diskette number 7. Diskette 7 contains two package files named *cid* and *required*. You need to unpack each of these files onto your code server. Assume you want to create your image in a directory named *d:\cid\img\os2v21* on your code server. Insert diskette 7 in your drive and type **UNPACK A:CID D:\CID\IMG\OS2V21**. Unpack *required* too. When you are done, you will find *seimage.exe* in *D:\CID\IMG\OS2V21*. Now, you are ready to create the OS/2 image. Insert your OS/2 installation diskette and type **SEIMAGE /a:A: /t:D:\CID\IMG\OS2V21**. *Seimage.exe* will prompt you to insert the remaining product diskettes until it has created the entire image.

Running the CID install

Follow the instructions for installing the CID product of your choice: NTS/2 or NvDM/2. RedBooks and cookbooks are available for both products. I recommend ordering *Automated Installation for CID Enabled Extended Services, LAN Server V3.0 and Network Transport Services/2* (GG24-3781-01) if you plan to use NTS/2 or NvDM/2. For NvDM/2, you will want the cookbook written by Wen Moy titled *OS/2 System Software Distribution and Installation Using NetView DM/2*.

This book is a fantastic step-by-step guide to installing NvDM/2 and using NvDM/2 to install your OS/2 products. The OS/2 **INSTALL** command line remains the same for both NTS/2 and NvDM/2 environments. For NTS/2, you will embed the **INSTALL** command in a REXX script. NvDM/2 stores the command in a profile. To run an OS/2 installation in a CID environment, you need a command line like:

```
X:\IMG\OS2V21\SEINST.EXE
/S:X:\IMG\OS2V21 /B:C:
/R:X:\RSP\OS2V21\SAMPLE.RSP
/L1:Y:\userid.log /T:A:\
```

A loose standard exists for CID-enabled software, so the parameters will be the same in nearly all CID-enabled products. X: represents the drive letter your CID product uses for the source drive. Remember, the drive letter is from the client perspective, as in the LAN Server or NetWare environment, not the code server's hard drive letter. Both NTS/2 and NvDM/2 have methods to replace this value with a variable. Refer to the documentation for how it works:

- Y: represents the drive letter your CID product uses to write logs back to the code server.
- /S: tells *seinst.exe* the source drive and directory on your code server.
- /B: is the boot drive for OS/2 on your target machine.
- /R: is almost always the response-file parameter, which includes the entire path and filename of the response file. Again, both NTS/2 and NvDM/2 have methods for replacing this value with a variable. Refer to their documentation for details.
- /L1: tells *seinst.exe* where to log the results of the installation. The installation log is handy for troubleshooting and verifications.
- /T: is a weird one. This tells *seinst.exe* which drive you just

booted from. Remember this one for later. Since we will boot from a diskette, this value will be A:.

Performing the installation will be slightly different for each product. But for both, you will need to create a modified set of OS/2 boot diskettes. You will start by running another of the programs, which was unpacked earlier: *sediskette.exe*. You run this program with two parameters: /S: and /T: representing the source and target drive and directories respectively. Then, you need to load LAPS and the CID product of your choice. Once you have created your installation diskettes, you can boot from them at your target machine and run your installation.

The process of booting from diskette for OS/2 installation is only required in a "pristine" environment when using NvDM/2. When a machine has no OS/2 or LAN code, it is considered a pristine machine. If you have OS/2 and LAN software on your target machines, you can automate every task when using NvDM/2.

The big payoff

CID software installation may sound like a lot of work. It's really not that bad. The benefits come to you once you have established your CID process. Every change that you want to make on the machines you support can be automated with CID. Every upgrade you want to install can be automated with CID. CSDS can be installed using CID. Who could ask for anything more?

Rob Coventry has worked for IBM since 1990 and is currently a member of the Midwest Area Consulting and Services Division. He has been consulting various clients on the topic of OS/2 distribution for the last two years. Rob has just completed the development of a staging process using CID for a large insurance client. He can be reached on CompuServe at 73764,625.

RESOURCES:

NTS/2 (\$85 per client)

IBM Direct
4111 Northside Pkwy.
Atlanta, GA 30327
(800) 426-2255
READER SERVICE NO. 153

LAD/2 (\$5,000 plus \$25 per client)

IBM Direct
4111 Northside Pkwy.

Atlanta, GA 30327
(800) 426-2255
READER SERVICE NO. 154

NvDM/2 Extended (\$1,495 per code server and \$95 for each client)

IBM Direct
4111 Northside Pkwy.
Atlanta, GA 30327
(800) 426-2255
READER SERVICE NO. 155

EZRAID

The Software RAID Solution for OS/2 Desktops & Servers



New EZRAID for OS/2 is the first quick and easy solution for improving disk transfer and adding fault-tolerance to any OS/2 system. EZRAID eliminates downtime caused by disk failure and dramatically enhances the integrity of your data.

EZRAID maximizes your investment in hardware by using low-cost standard IDE and SCSI disk drives and host adapters providing significant cost savings over proprietary hardware-based RAID systems.



Turbo-Charged Disk Performance

- ▶ provides highest possible disk transfer rate for OS/2
- ▶ stripes data across multiple disks using parallel disk I/O
- ▶ optimizes execution of OS/2 databases like Lotus Notes and DB/2
- ▶ superior built-in caching of reads and writes for enhanced performance

Complete System Fault-Tolerance

- ▶ sustains the loss of data from media defects or a complete drive failure
- ▶ mirrors existing logical drives without the need to backup, reformat or reboot
- ▶ adds Hot Standby disks or Hot Swap failed disks without shutting down

Increased Storage Capacity

- ▶ combines multiple physical disks into a single large logical drive
- ▶ expands maximum file sizes beyond the capacity of a single disk

Unlimited Flexibility

- ▶ supports OS/2 2.x and LAN Server Advanced
- ▶ works with any combination of disk types (SCSI, IDE, Fast SCSI, Fast IDE, etc.)
- ▶ uses different disk types and RAID levels in same physical array
- ▶ supports multiple host adapters with a single array
- ▶ uses disk mirroring for remarkably fast back-ups

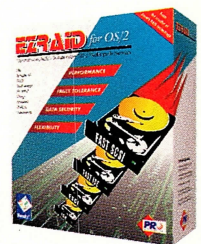
Easy Installation and Use

- ▶ installs and create multiple arrays in minutes
- ▶ powerful utilities to monitor and manage disk arrays



FOR MORE INFO OR TO ORDER CALL:

1-613-738-3864



PRO Engineering, Inc. 1145 Hunt Club Road, Ottawa, ON K1V 0Y3 Canada FAX: (613) 738-3871

Reader Service No. 25

Tuning NetWare, Part III

Implementing IBM-Novell Interoperability by Bob Panza

In May, we discussed how to optimize many of the *net.cfg* settings found in Novell's NetWare Client 2.01 for OS/2, also known as the NetWare Requester ("NetWare Fine Tuning" pp. 41-45). Last month, we explored fine-tuning the NetWare Client if you're using Novell's ODI drivers as a means of accessing the network adapter ("NetWare Tuning with ODI" pp. 41-45). This month, we'll conclude our optimization journey by discussing *lansup.sys*, which is Novell's driver for interfacing with IBM Extended Services. We'll also touch on IBM's *odi2ndi.sys* driver, which facilitates closer IBM-to-Novell interoperability.

Listing 1: *Protocol.ini* changes for ODI2NDI configuration.

The LAPS program makes an ODI2NDI entry into the **IBMLXCFG** section of the *protocol.ini* file and adds an **ODI2NDI_NIF** section which specifies frame types resembling those we saw in *net.cfg*. The workstation is set up for Token-Ring.

```
[IBMLXCFG]
IBMTOK_nif = IBMTOK.nif
LANDD_nif = LANDD.nif
ODI2NDI_nif = ODI2NDI.nif

[ODI2NDI_nif]
DRIVERNAME = ODI2NDIS$
BINDINGS = IBMTOK_nif
TOKEN-RING = "YES"
TOKEN-RING_SNAP = "YES"
ETHERNET_802.3 = "NO"
ETHERNET_802.2 = "NO"
ETHERNET_II = "NO"
ETHERNET_SNAP = "NO"
TRACE = 0x0
```

NDIS drivers

Do you remember OS/2 Extended Edition 1.x? NetWare Client's *lansup.sys* replaces OS/2 1.x's *tokenee.sys* and its successor, *cmgrlan.sys*. The new *lansup.sys* is named after *lansup.com*, the Novell ODI driver that sits above the

Listing 2: *Config.sys*

The LAPS program places most of its entries after the NetWare Requester section. *Odi2ndi.os2* becomes the driver to interface the NetWare Requester directly with NDIS, rather than through 802.2 (*landd.os2*) such as in the *lansup.sys* configuration. *Odi2ndi.sys* is inserted between *lsl.sys* and *route.sys* where *token.sys* and *lansup.sys* are located in the configuration examples.

REM lines inserted before the NetWare Requester section:

```
DEVICE=C:\IBMC\LANMSGDD.OS2 /I:C:\IBMC\
DEVICE=C:\IBMC\PROTMAN.OS2 /I:C:\IBMC\
```

REM NetWare Requester section (partial view):

```
SET NWLANGUAGE=ENGLISH
DEVICE=C:\NETWARE\LSL.SYS
RUN=C:\NETWARE\DDAEMON.EXE
device=c:\ibmcom\protocol\odi2ndi.os2
DEVICE=C:\NETWARE\ROUTE.SYS
DEVICE=C:\NETWARE\IPX.SYS
DEVICE=C:\NETWARE\SPX.SYS
```

REM after NetWare Requester section:

```
RUN=C:\IBMC\PROTOCOL\NETBIND.EXE
RUN=C:\IBMC\LANMSGEX.EXE
DEVICE=C:\IBMC\PROTOCOL\LANDD.OS2
DEVICE=C:\IBMC\PROTOCOL\LANDLLDD.OS2
DEVICE=C:\IBMC\MACS\IBMTOK.OS2
RUN=C:\IBMC\PROTOCOL\LANDLL.EXE
```


IEEE 802.2 interface of IBM LAN Support Program on DOS workstations. Likewise, the NetWare OS/2

Client with *lansup.sys* runs on top of the IBM Extended Services IEEE 802.2 interface.

In fact, *lansup.sys* replaces any Novell-specific hardware driver, such as *token.sys* or *ne2000.sys*. With

Listing 3: Protocol.ini

With LANSUP, the standard IBM NDIS drivers are required. *Lansup.sys* and Novell ODI do not hook directly into NDIS. Instead, they reside above the IBM communications interfaces and drivers. Link support buffer size in the *net.cfg* needs to be 4,202 bytes, or six bytes smaller than **XMITBUFSIZE**.

```
[PROT_MAN]
DriverName = PROTMAN$
```

```
[IBMLXCFG]
IBMTOK_nif = IBMTOK.NIF
LANDD_nif = LANDD.NIF
```

```
[LANDD_nif]
DRIVERNAME = LANDD$
BINDINGS = IBMTOK_nif
ETHERAND_TYPE = "I"
SYSTEM_KEY = 0X0
OPEN_OPTIONS = 0X2000
TRACE = 0X0
LINKS = 41
MAX_SAPS = 5
MAX_G_SAPS = 0
USERS = 4
```

```
[IBMTOK_nif]
DRIVERNAME = IBMTOK$
PRIMARY
MAXTRANSMITS = 12
RECVBUFS = 2
RECVBUFSIZE = 256
XMITBUFS = 1
XMITBUFSIZE = 4208
```

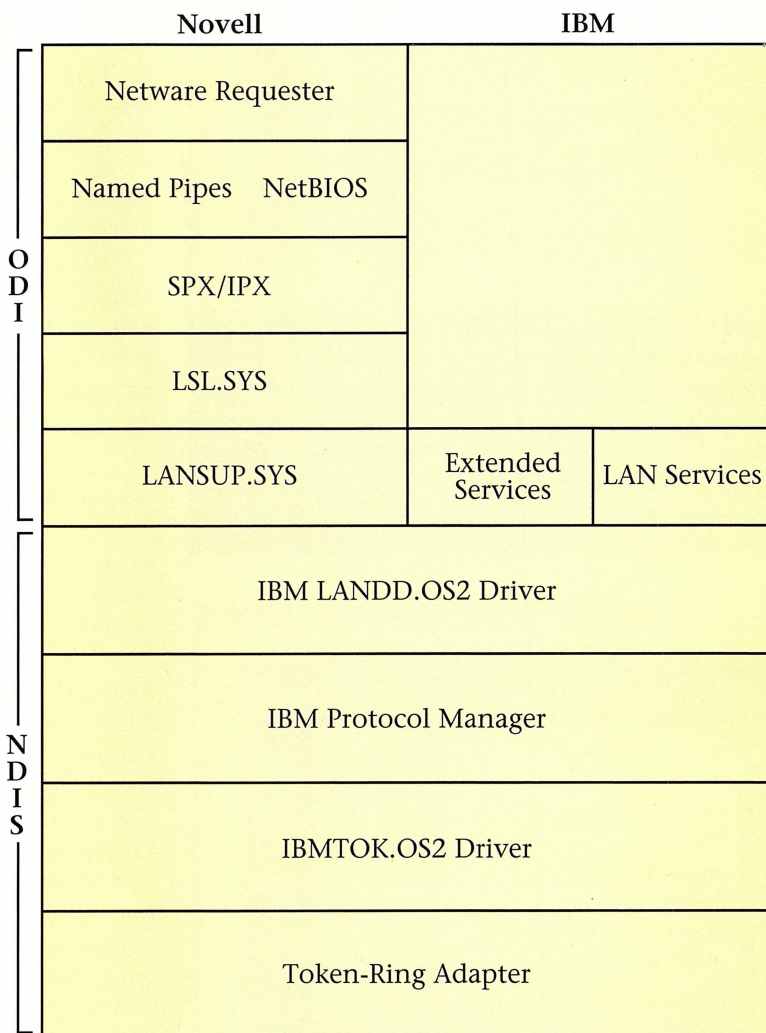


Figure 1: LANSUP enables Novell's ODI stack to sit on top of the IBM Extended Services NDIS-based architecture. Notice that the ODI stack is pushed way up. The resulting diagram defies almost all resemblance to the OSI model. The placing of the NetWare Requester on top of IBM communication interfaces was the original way of configuring Novell/IBM interoperability and dates back to the early days of the NetWare Requester on IBM's OS/2, Extended Edition.

Listing 4: PATHs

PATH lines are similar to those shown for the ODINSUP configuration in last month's issue. The position of **\ibmcom** directories relative to **\netware** can be affected by the sequence of software installation. In addition, **\netware** precedes **l:\os2** and **p:\os2** because NetWare OS/2 utilities are stored locally.

```
LIBPATH=.; C:\OS2\DLL; C:\MUGLIB\DLL; C:\OS2\MDOS; C:\CMLIB\DLL; C:\; C:\OS2\APPS\DLL;
C:\NETWARE; C:\IBMCOM\DLL
SET PATH=C:\OS2; C:\MUGLIB; C:\OS2\SYSTEM; C:\OS2\MDOS\WINOS2; C:\CMLIB; C:\CMLIB\APPN;
C:\OS2\INSTALL; C:\; C:\OS2\MDOS; C:\OS2\APPS; C:\NETWARE; L:\OS; P:\OS2
SET DPATH=C:\OS2; C:\MUGLIB\DLL; C:\CMLIB; C:\CMLIB\APPN; C:\OS2\SYSTEM; C:\OS2\MDOS\WINOS2;
C:\OS2\INSTALL; C:\; C:\OS2\BITMAP; C:\OS2\MDOS; C:\OS2\APPS; C:\NETWARE; C:\IBMCOM; L:\OS2;
```

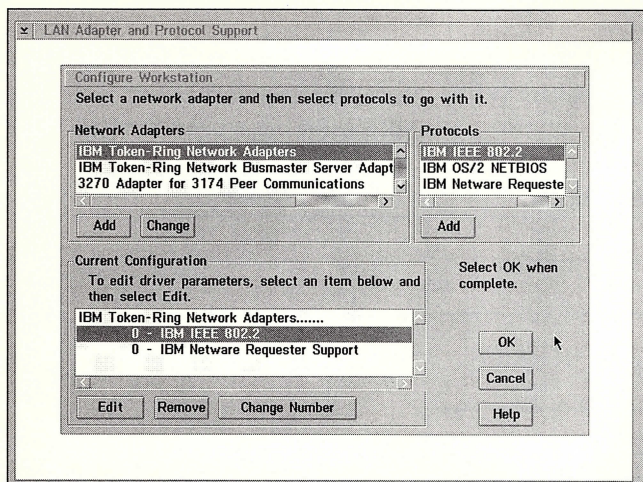



Figure 2: The IBM LAN Adapter and Protocol Support (LAPS) program configures the OS/2 node for different adapters, protocols, and protocol parameters. LAPS is part of the Network Transport Services/2 (NTS/2) package, which is like a LAN Support Program package for OS/2. NTS/2 includes the IBM *odi2ndi.os2* driver for interfacing the NetWare Requester directly with low-level IBM NDIS drivers—the reverse of Novell's *odinsup.sys* driver, discussed in June.

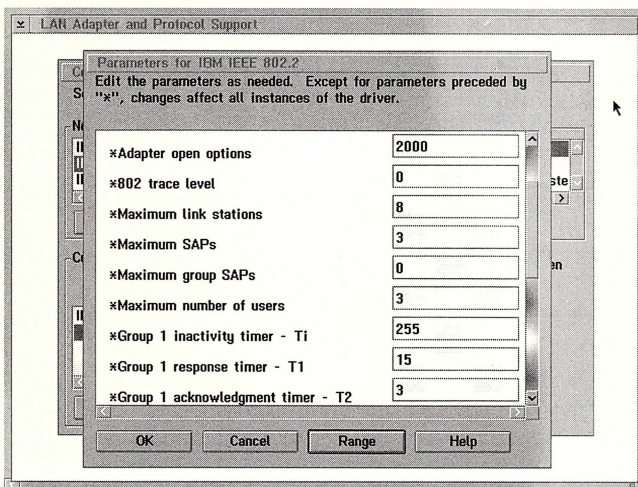


Figure 3: IBM IEEE 802.2 parameters specify Token-Ring adapter configuration and timer settings. The 802.2 interface is important for interoperability with network layer communication protocols. It serves as the interface used by 3270 terminal emulation running over Token-Ring. Novell's *lansup.sys* also sits on top of 802.2 in order to utilize IBM lower-layer drivers, which in turn access the network adapter. A Service Access Point (SAP) is like a port reaching down into the adapter that allows access by a single communications program.

lansup.sys, the full range of frame types do not need to be defined unless the NetWare Requester requires them. Extended Services, rather than NetWare, will control and configure the adapter. For SPX/IPX traffic, *net.cfg* LINK DRIVER examples applicable to Token-Ring and Ethernet are as follows:

```
LINK DRIVER LANSUP
```

Listing 5: IBM Communication Lines

Protocol Manager (*protman.os2*) loads prior to the 802.2 interface LAND drivers. *Ibmok.os2* is the IBM MAC layer driver for NDIS. The underlying configuration remains fairly standard from the IBM perspective.

```
DEVICE=C:\IBMCOM\LANMSGDD.OS2 /I:C:\IBMCOM
DEVICE=C:\IBMCOM\PROTMAN.OS2 /I:C:\IBMCOM
DEVICE=C:\IBMCOM\PROTOCOL\LANDD.OS2
DEVICE=C:\IBMCOM\PROTOCOL\LANDLLDD.OS2
```

```
DEVICE=C:\CMLIB\ACSLDLAN.SYS
RUN=C:\OS2\EPW.EXE
device=c:\ibmcom\macs\ibmtok.os2
RUN=C:\IBMCOM\PROTOCOL\LANDLL.EXE
RUN=C:\IBMCOM\PROTOCOL\NETBIND.EXE
RUN=C:\IBMCOM\LANMSGEX.EXE
DEVICE=C:\CMLIB\APPN\CMKFMDL.SYS
```

```
FRAME TOKEN-RING
```

```
LINK DRIVER LANSUP
FRAME ETHERNET_802.2
FRAME ETHERNET_SNAP
```

Again, the first **FRAME** line will be utilized by the Get Nearest Server broadcast. Notice that *lansup.sys* does not support the Ethernet_802.3 frame type (raw), which means trouble for SPX/IPX traffic on enterprise Ethernet. The workaround is to initialize both Ethernet_802.2 and Ethernet_802.3 frames on NetWare servers as required. The NetWare servers will then route SPX/IPX traffic between the two logical networks formed by the workaround. Each frame type needs its own unique network (NET) number.

You can tune *net.cfg* parameters accordingly per NetWare requirements. However, since ODI does not have control of the adapter, the *net.cfg* configuration must not exceed the resources specified within the Extended Services' *protocol.ini* file. The orchestration between *net.cfg* and *protocol.ini* parms is important. For example, the link buffers for IBM Token-Ring 16/4 adapters optimized as:

```
LINK SUPPORT
BUFFERS 14 4202
```

or 14 buffers at 4,202 bytes each, requires a transmit buffer in *protocol.ini* set to:

```
XMITBUFSIZE=4208
```

which is six bytes larger than 4,202. (The **XMITBUFSIZE** value must be a multiple of eight.) In other words, the *net.cfg* buffers cannot be larger or greater in number than whatever the *protocol.ini* specifies. The NDIS MAC

The key to
making
object-oriented
technology
work for your
business
is one simple
equation.

OOT = IBM

Object-oriented technology adds up for your business.

Faster development. Increased programmer productivity. Higher-quality, lower-maintenance applications. Code reuse. The ability to respond quickly to changing business conditions.

Object-oriented technology is the answer you need to make your business more competitive. With 45 major-league development projects behind us, including OS/2® Presentation Manager® and COBOL/SF, IBM is the company that

for OS/2. With its exceptionally reliable 32-bit C/C++ compiler, its extensive C++ class libraries, and its full function browser, you have the language and the tools you need to produce serious OO applications today, with code that can easily be reused tomorrow.

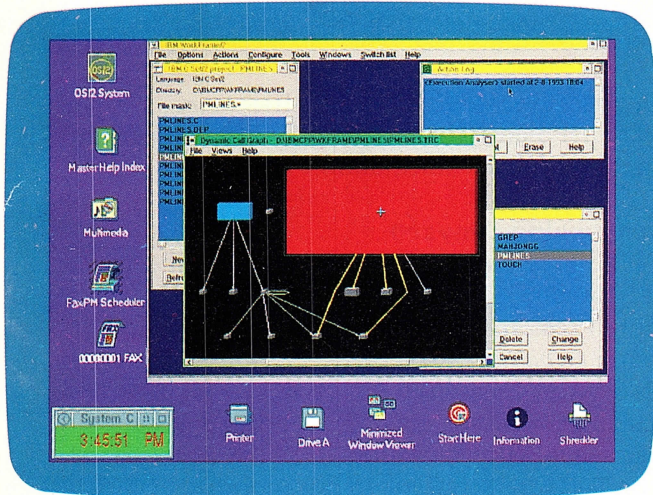
VisualAge.™ A powerful new vision of programming.™

VisualAge is IBM's hot new visual programming tool that lets you produce scalable, object-oriented client/server applications with amazing speed. Using

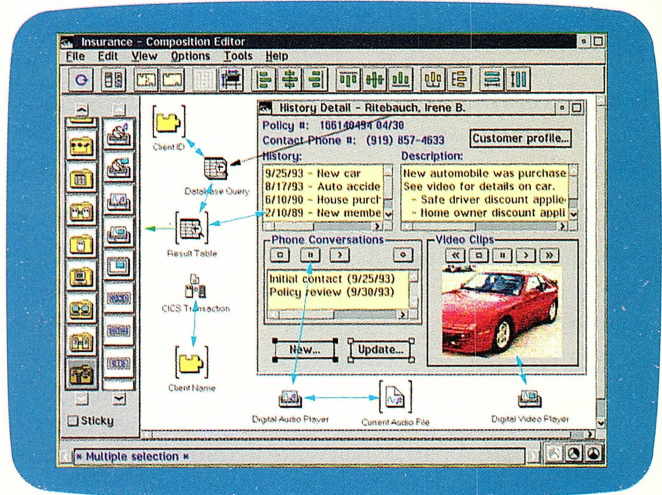


SOM. The common thread for object environments.

IBM's System Object Model (SOM) and Distributed System Object Model (DSOM) are language-neutral mechanisms for developing class libraries. With SOM, you can develop objects in one language and easily use them in another. And SOM supports CORBA, the Common Object Request Broker Architecture of the Object Management Group (OMG).



C Set ++ is the most complete C++ object-oriented development tool you can buy for OS/2.



VisualAge combines the ease of visual programming with the power of object technology.

delivers the object solution and the services you need to take full advantage of the new technology. From infrastructure to tools to development platforms for commercial and technical developers, nobody is doing more to balance the OOT equation than IBM.

C Set ++.™

Mission-critical code starts here.

IBM's C Set ++ is the development package behind many of today's popular software programs, like Lotus 1-2-3®

intuitive graphical interface tools and a completely integrated Smalltalk base, you and your team can link and share objects by connecting icons and build new industrial-strength applications out of code that has already been written.

VisualAge makes your programming faster and more responsive, because it lets you recycle your code instead of rewriting it. And it gives you easy access to the entire DB2® family of relational database management systems.

Get started today.

This is only the beginning. To receive our IBM white paper on new directions in object technology, or to order IBM OOT products and services, just call us at 1 800 IBM-3333, ext. STAR 700.

And we'll show you how easy it is to write yourself into the OOT equation.

SOFTWARE FOR OBJECT-ORIENTED TECHNOLOGY



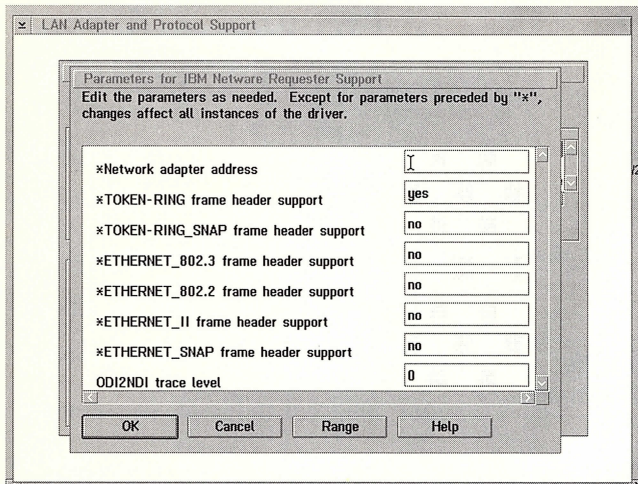


Figure 4: The LAPs program can also be used to help configure the Novell NetWare Requester to run with the IBM *odi2ndi.sys* driver. Adapter frame types are specified to make *protocol.ini* file entries that will configure the adapter for the topology and network protocols to be initialized. Frame types follow the options for the NetWare Requester's *net.cfg* file, as we discussed in May.

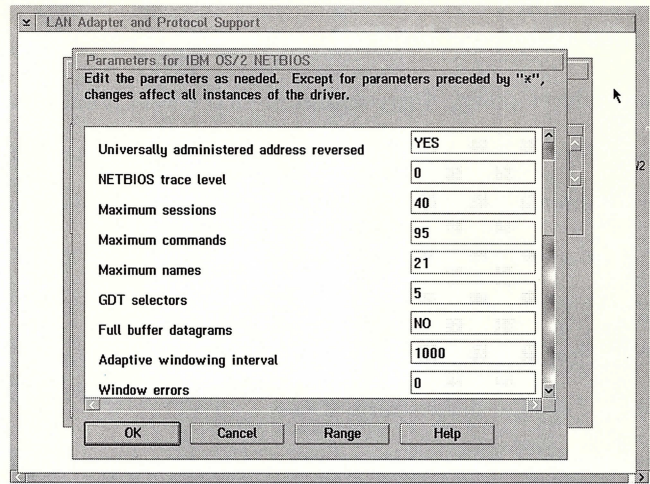


Figure 5: IBM's OS/2 NetBIOS must be set up to support IBM LAN Requester or LAN Server. NetBIOS may be run concurrently with other protocols, such as SPX/IPX, TCP/IP, LLC, and Named Pipes. The OS/2 workstation can participate in native Novell, IBM, and UNIX LAN functionality at the same time. Token-Ring adapter architecture grants NetBIOS its own SAP apart from the 802.2 SAPs. In effect, all NetBIOS communications programs utilize the same SAP.

layer driver (IBMTOK), which was disabled in the *protocol.ini* for *odinsup.sys*, must remain active with *lansup.sys*. The node address needs to be defined in the *net.cfg* even if the burned-in address is used.

In the *config.sys* file, path lines are essentially the same as they were in the *odinsup.sys* configuration, discussed last month. In addition, Protocol Manager and NDIS driver lines are similarly positioned to precede the NetWare Requester section. In the NetWare Requester section, *lansup.sys* replaces *token.sys*, and *odinsup.sys* is not present. *Route.sys* will be needed on bridged Token-Rings, as usual. A partial NetWare Requester section listing is as follows:

```
SET NWLANGUAGE=ENGLISH
DEVICE=C:\NETWARE\LSL.SYS
RUN=C:\NETWARE\DDAEMON.EXE
device=c:\netware\lansup.sys
DEVICE=C:\NETWARE\ROUTE.SYS
DEVICE=C:\NETWARE\IPX.SYS
DEVICE=C:\NETWARE\SPX.SYS
```

IBM has a more direct approach, via the NTS/2 package, for placing ODI on top of NDIS. ODI2NDI_NIF and *odi2ndi.sys* are respectively placed in the *protocol.ini* and *config.sys* files via the LAPS program. ODI2NDI is like ODINSUP in reverse. Rather than placing NDIS on top of ODI, ODI is positioned above NDIS. ODI2NDI differs from LANSUP because LANSUP requires the 802.2 interface of *landd.os2* (and *landldd.os2*) between it (LANSUP) and the lower level NDIS architecture. NDIS binding can occur before the NetWare Requester with LANSUP. In contrast, ODI2NDI always binds after the NetWare Requester section in the *config.sys*. The IBM LAPS pro-

gram places the IBM directories, such as *\ibmcom*, in the front rather than at the end of the *PATH* lines illustrated in the Novell documentation.

Interworking Onward

If LAN Services were also installed, additional lines would have been added to *config.sys* after the NetWare Requester section. Those lines load *netwksta.200* (LAN Services file system), *netbios.os2* (IBM NetBIOS), and *lsdaemon.exe* (LAN Services daemon) followed by several IBMCOM executables: *landll.exe*, *netbind.exe*, and *lanmsgex.exe*.

Beforehand, the three IBMCOM executables preceded the NetWare Requester in last month's ODINSUP and this month's ODI2NDI examples where LAN Services was not deployed. With LAN Services, the six files mentioned must follow the NetWare Requester because the NetWare Requester file system (*nwifs.ifs*) needs to be initialized prior to loading the LAN Services file system. The presence of LAN Services also means additions to the *protocol.ini* file and possibly other configuration modifications to concurrently accommodate IBM NetBEUI and Novell NetBIOS.

What's next? The introduction of TCP/IP will open up new interoperability horizons beyond those we have so far discussed for the OS/2 platform. Which OS/2 TCP/IP package shall we choose? Novell's LAN WorkPlace or IBM's TCP/IP for OS/2? How does the choice impact the configuration of OS/2 network nodes and their capabilities across the enterprise? Stay tuned for adventures in OS/2 TCP/IP implementation.

Bob Panza is a LAN consultant affiliated with EJ R Computer Associates in Hoboken N.J. and The Systems Expert in Woodbury, Conn. He can be reached via CompuServe as 71611,1262.

Voodoo Secrets

A look at *Voodoo OS/2* and *OS/2 Secrets and Solutions* BY CHARLES BERMANT

Using personal computers represents an unending series of decisions. For example, once you have decided to move to OS/2, you might also decide to buy a book to use as a guide through the orientation process. Now, you must decide whether to use a less formal approach that provides a good foundation for using the system or invest in a larger, more thorough (and correspondingly less interesting) reference tool. Whether you choose *Voodoo OS/2* (the former) or *OS/2 Secrets and Solutions* (the latter) will depend upon your current position on the OS/2 learning curve.

Voodoo OS/2

If you have been using OS/2 for more than a week, much of *Voodoo OS/2* will be familiar. Time spent reading this book, however, does not have to be wasted. The text is annotated by pictures, lists, and subheads, so it's easy to find what you need and easily skip over what you already know. Any self-taught OS/2 user can benefit from a quick skim through this book. For example, you may have mastered basic interface use, but have no idea what a shadow does. Scanning this book is like fast-forwarding through an orientation videotape to skip the parts about the cafeteria. As a relatively experienced user, I didn't find much unfamiliar material, but the book explains some shortcuts and concepts more clearly than I have seen in the past.

**Whether you
choose *Voodoo OS/2* or *OS/2
Secrets and Solutions* will
depend upon your current
position on the OS/2 learning
curve.**

A lot of the advice provided is just informed common sense. The best tip I found suggests that you get a backup mouse and place it on the shelf in case the old one suddenly dies. Anyone who has faced the possibility of using OS/2 without a mouse will laud this as great advice—even if it is not strictly an OS/2 tip.

The book also provides some tips that I disagree with. For example, the author suggests that you reset the internal clock/calendar to fool a timed virus. This is bad advice. You are either safe from viruses (using appropriate software) or you are not. Changing the clock does nothing for virus protection, but only offers a false sense of security. You also get the impression that after the manuscript was three quarters of the way completed, Taylor lost interest. All he has to say about PM Terminal is "just about any commercial or

shareware program is better." This statement may be true, but PM Terminal is still useful for logging on to MCI and CompuServe or for simple file transfers. A few notes about its shortcomings and how to overcome them would have been welcome.

OS/2 Secrets and Solutions

If *Voodoo OS/2* is a book to read once and pass on, you might keep *OS/2 Secrets and Solutions* around for a while (incidentally, it contains several pages about PM Terminal). It has much of the same background information and boasts a similar scannable format. This is a computer book in the traditional sense: You wouldn't want to actually read the whole book, but you would keep it nearby to solve problems as they arise.

As *OS/2 Secrets and Solutions* looks fairly technical, it would probably intimidate the average novice (or *Voodoo OS/2* reader). This is a shame, because the featured lists and graphs are clear and necessary to get the point across or address the questions in a thorough manner. In all cases, complicated procedures are explained in simple and direct terms, so the book stands to support you as your needs and knowledge grow.

The book includes several pages of DOS, Windows, and OS/2 compatibility tips—those little adjustments you need to make for programs to run well under OS/2. These sometimes obscure fixes

Reach 60,000 Corporate Buyers



MARKET PLACE

- OS/2, Windows, DOS Software
- High-end Computer Systems
- Powerful Peripherals
- Memory, Board and Upgrade Products
- Storage & Backup Solutions
- Networking Products & Services
- Enterprise Computing
- Multimedia
- Services & Consulting

Advertise in the **OS/2 Magazine**
OS/2 MARKETPLACE

Call today to place an ad!

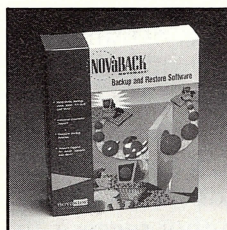
EAST: Lisa Kraus (212) 626-2448

WEST: Molly Knox (415) 905-8126



Get
BackUp
and
Running!

NovaBack for OS/2 is a complete backup solution for all OS/2 workstations or networks. NovaBack supports over 250 SCSI and QIC-80 tape drives. It is also compatible with OS/2 2.X and LAN Server networks.



NovaBack for OS/2 also comes with *NovaBoot—Disaster Recovery System*. NovaBoot allows you to prepare for your worst nightmare. . . a hard disk failure. That's right! Use NovaBoot and restore your entire system from tape without having to reload your entire operating system.

With NovaBack you not only get backup, you get back up and running!

30961 Agoura Rd., Suite 109
Westlake Village, CA 91361
(818) 707-9900
Fax (818) 707-9902

novastor
CORPORATION

Reader Service No. 26

may be impossible to find elsewhere or figure out on your own, so they can save you a lot of time and effort. The coverage of Windows is healthy and robust (including instructions on how to make OS/2 look like Windows) and, as throughout the book, does not assume the reader has a lot of prior knowledge.

Part of the reason that *OS/2 Secrets and Solutions* costs a lot more than *Voodoo OS/2* has to do with the inclusion of disks. In fact, its comparative worth has little to do with these programs. You will find something in this smattering of shareware that you can use (a few games and an anti-virus program from McAfee Associates), but nothing that you can't live without. The disks included in the book are 5.25 inches (you have to send away for 3.5-inch disks), which is both puzzling and inconvenient.

While *Voodoo OS/2* is less expensive, a better read, and contains information that is easier to assimilate, the price of *OS/2 Secrets and Solutions* is justified, not for the software, but because it has more information.

Charles Bermant is a freelance writer specializing in technology and music.

RESOURCES

Voodoo OS/2 (\$24.95)

By Allen G. Taylor
Ventana Press
P.O. Box 2468
Chapel Hill, NC 27515
(919) 942-1140

READER SERVICE NO. 156

OS/2 Secrets and Solutions (\$44.99)

By Peter Dyson
Sybex
2021 Challenge Dr.
Alameda, CA 94501
(800) 227-2346

READER SERVICE NO. 157

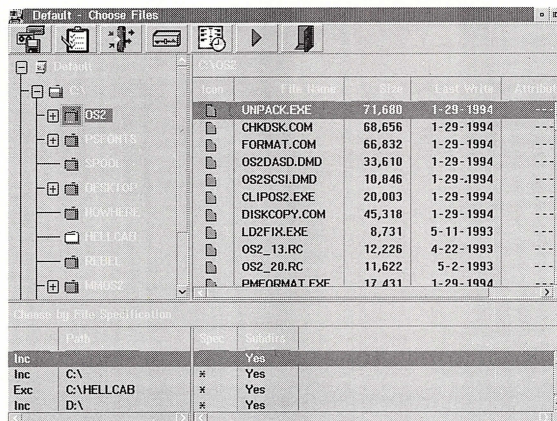
Fastback Plus for OS/2 1.0

OS/2 backup with cross-platform support

Symantec announces the first release of the OS/2 version of their backup program Fastback Plus. The 32-bit multithreaded backup program is file-compatible with DOS and Windows versions of Fastback. Other features include a Workplace Shell drag-and-drop interface, backup speeds of up to 28MB per minute, automatic scheduling, and compression. The media backups can be stored on floppy disks, QIC 40/80 tape drives, SCSI tape drives, Bernoulli boxes, Syquest Drives, and network drives. OS/2-specific backup features include support for HPFS, extended attributes, and a Quick Crash Recovery feature that allows a complete restore even if the system is damaged.

Fastback Plus sells for \$189. It requires OS/2 2.x or higher and 2MB of hard disk space. Call Symantec at (800) 441-7234 or (503) 334-6054.

READER SERVICE NO. 158



any need for the original disks. The tape sells for \$299 and additional OS/2 site licenses can be purchased through PSS. Quick/2 Install will work only on Parallel Storage Solutions tape backup machines. Call (800) 998-7839 or (919) 347-7044 or fax (919) 347-4646.

READER SERVICE NO. 160

Screen Magnifier/2

OS/2 gets easier to see

IBM has released a new product designed to help people with poor vision use OS/2. Screen Magnifier/2, an OS/2 product, allows any DOS, OS/2, or Win-OS/2 session to be viewed at two to 32 times its normal size and provides a reading mode that pans the cursor along text, Focus Tracking that moves the mouse to an active dialog box, and a locator that allows you to see what portion of the screen is being magnified. Screen Magnifier/2 is available from IBM for \$495. Call (800) 426-4832.

READER SERVICE NO. 161

SmartSuite 1.1 for OS/2

Lotus updates across the board

Lotus Development has updated SmartSuite for OS/2 to version 1.1. The new release contains updated versions of most of the applications included in SmartSuite. New versions of Lotus 1-2-3 and Freelance Graphics, which are now at version 2.1, will be VIM and CID enabled. The new version of Lotus 1-2-3 for OS/2 will have new DataLens drivers, new C-API extensions, more SmartIcon palettes, and new @ functions. Current shipping versions of AmiPro 3.0a and cc:Mail 1.0 are also included. SmartSuite includes the Lotus Application Manager, a utility that helps facilitate switching between Lotus applications. If you

are using the current version of the OS/2 SmartSuite, call (800) 872-3387 to receive an update kit (for the price of shipping) that will give current versions of all the software. SmartSuite sells for \$795. Call Lotus Development at (404) 391-0011 or fax (404) 698-7660.

READER SERVICE NO. 159

Quick/2 Install

Install OS/2 in record time

Parallel Storage Solutions has taken the OS/2 installation files, modified them, put them on a QIC tape, and packaged them to make Quick/2 Install. The package allows you to pre-install all OS/2 drivers from the 2.11 release eliminating

EMS OS/2 Utility Library

A new repository of OS/2 Shareware

EMS Professional Shareware is updating their OS/2 Utility Library to include new shareware utilities. This collection of utilities, programming tools, graphics tools, and images is intended for OS/2 2.x programmers and power users. 502 products come distributed on 47 3 1/2 inch disks or one

SMART
SOURCE MIGRATION ANALYSIS REPORTING TOOLSET

S **m**

 a

r **t**

OneUP Corporation

The Complete Application Source Code Conversion Toolset

For more information, call 800-678-01UP or FAX 214-620-9626.



Reader Service No. 40

CD-ROM. The library sells for \$59.50 and is available directly from EMS. Call (301) 924-3594 or fax (301) 924-2708.

READER SERVICE NO. 162

IControl Plus 2.1

The desktop beautification project

Orange Hill Software releases version 2.1 of their icon management product, IControl Plus. Icon management features include an icon scheme editor that universally updates icons in a specific folder or directory and an update feature that automatically updates icons as new files are added to folders. IControl Plus comes with 450 icons that can be used by dragging and dropping files onto them with the Icon Library tool. It also gives you the ability to build more icon library tools. IControl Plus sells for \$59.95. Call (714) 524-5851.

READER SERVICE NO. 163

PowerScan for OS/2

Recognize and scan in OS/2

Recognita Corp., known for their Rscanning and optical character recognition (OCR) software and Globalink Inc., the makers of Power Translator, have joined forces to create PowerScan. PowerScan is a stand-alone OS/2 product that scans and uses OCR to read documents in languages that use different character sets. PowerScan supports Spanish, French, German, Swedish, English, Danish, Dutch,

Finnish, Italian, Norwegian, Portuguese, and Russian/Cyrillic characters. The converted documents, however, are not translated but special characters will be correctly scanned. PowerScan for OS/2 is available for \$199 from Globalink at (703) 273-5600 or fax (703) 273-3866.

READER SERVICE NO. 164

The Graham Utilities

A new set of utilities for OS/2

WarpSpeed Computers announces The Graham Utilities for OS/2, a suite of disk, file, and general-use utilities for OS/2 systems. It includes tools to enhance

batch files and various disk-management utilities, as well as tools to manipulate screen attributes, perform a word count on specified files, display extended attribute information, dump or edit a file in hexadecimal format, check sum files, and convert archived files to LZH format. The Graham Utilities for OS/2 include an integration utility known as The Graham Integrator, which provides a single unified interface to the various utilities, as well as on-line help that briefly describes the use of each utility. The Graham Utilities for OS/2 sells for \$193. Contact WarpSpeed Computers in Australia at 61-3-384-1060 or fax 61-3-386-9979.

READER SERVICE NO. 165

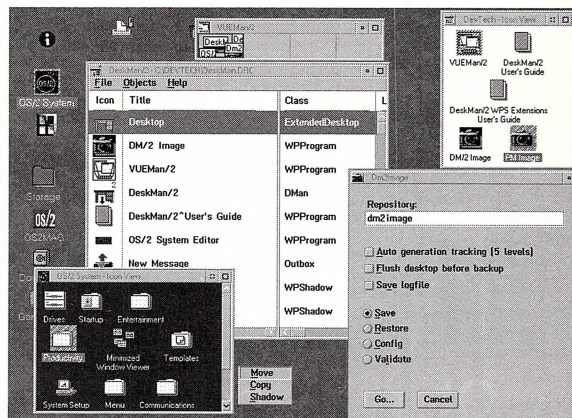
Deskman/2 1.5

Get the Workplace out of its Shell

DevTech Inc. announces the release of Deskman/2 1.5, the latest version of their set of Workplace Shell manipulating utilities. Deskman/2, a WPS object manipulator, has added interactive object manipulation, support for private string data, the ability to save the sorting order of folders, and

improved help and installation programs. In addition, Devtech has improved and updated Vueman/2, a virtual desktop program and Deskman/2 Workplace Backup Facility. The release also contains the Deskman/2 WPS extensions, which allow modifications to be made to all OS/2 objects. Other features include the ability to remove individual menu items for individual or system-wide objects, extensions to OS/2's drag-and-drop facilities, and password protection for all objects. Deskman/2 1.5 sells for \$79.95. Contact DevTech at (803) 790-9230 or fax (803) 738-0218.

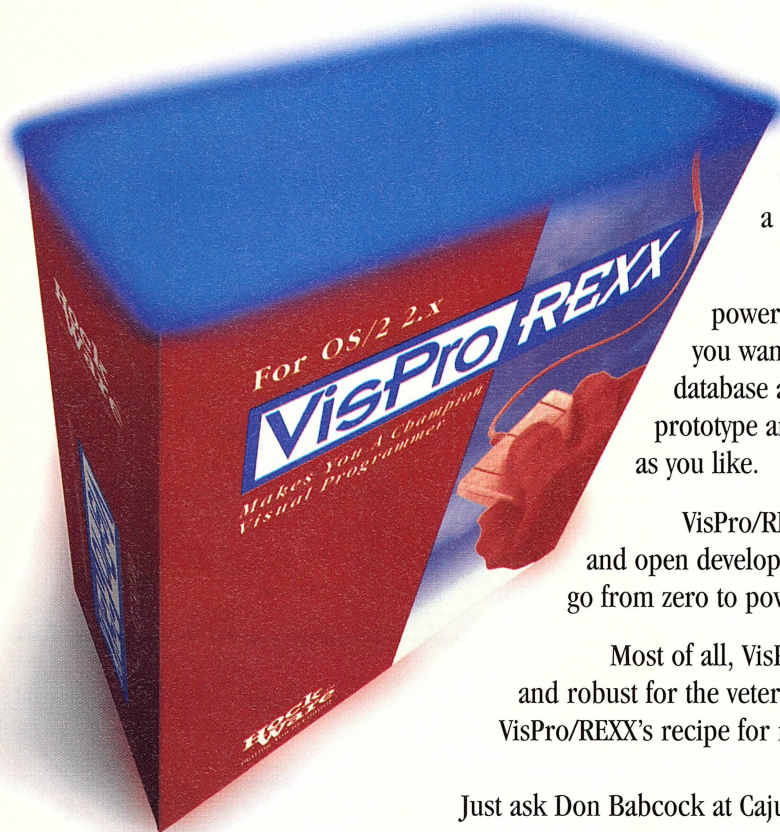
READER SERVICE NO. 166



Customers Agree...

"VisPro/REXX has the right ingredients for delivering OS/2 applications fast."

-Don Babcock, Client Services Manager, Cajun Electric Power



Don Babcock knows application development -- he has been working in it for more than 15 years. He is using VisPro/REXX™ for client/server development at Cajun Electric Power Cooperative, which dishes up electricity to more than a million people in Louisiana. We're talking power!

VisPro/REXX has proven itself to customers as a powerful and productive OS/2 development tool. Whether you want to build a time-saving utility program or client/server database application, VisPro/REXX allows you to quickly prototype and deploy your royalty-free programs to as many users as you like.

VisPro/REXX has an abundance of CUA '91 objects, a complete and open development environment and many more features to help you go from zero to powerful in a few strokes of a mouse.

Most of all, VisPro/REXX is easy-to-use for the novice user and robust for the veteran programmer. Simple and powerful, that's VisPro/REXX's recipe for red-hot OS/2 applications.

Just ask Don Babcock at Cajun Electric.



Other experts agree...

"...(VisPro/REXX) is one of the most object-oriented application development tools we have had the pleasure to use."

- Personal Computer Magazine, November 1993.

"There is no doubt, VisPro/REXX is an excellent product; probably the best of its class in terms of functionality."

- OS/2 Pointers, September/October 1993.

Free Object Pack with Order!

Call us today with your order and get a free VisPro/REXX Object Pack!

Data Entry Object Pack is a \$119 value. Pack includes Formatted Entry Field, Spreadsheet, Split Bar, Clock and Calendar objects. (Limited-time offer.)



919-380-0616

\$99 Bronze Edition \$299 Gold Edition

- True Workplace Shell-enabled drag and drop programming
- Support for numerous CUA'91 user interface objects
- Full-featured animated graphical debugger
- Open environment allowing you to add more user interface objects using our SOM toolkit
- Access to Database Manager, DB2/2 and Q+E's Database Library

Additional features in the Gold edition:

- The **most** CUA '91 objects of any tool in its class
- Visual database designer for creating DB2/2 applications or reverse-engineering DB2/2 databases using E/R diagrams
- Support for creating and debugging multi-threaded applications
- 3-D business graphics and report printing
- MPM/2 video window for full motion multimedia

System Requirements: OS/2 2.x,
5Mb memory and 2.5 Mb hard disk space

HockWare Incorporated, P.O. Box 336
Cary, NC 27512-0366 (USA),
Telephone: (919) 380-0616, Fax: (919) 380-0757

HockWare™
Putting You in Control

HockWare and VisPro/REXX are trademarks of HockWare Incorporated. All other company, product and brand names are trademarks and/or registered trademarks of their respective holders and are mentioned for reference purposes only. ©HockWare Incorporated 1994. All rights reserved.



Never Completely Helpless

BUILD YOUR OWN TEXT-STRING LOCATOR IN REXX BY ALEX LANE

One corollary to Murphy's Law is that no matter how comprehensive your suite of applications is, a time may come when you are completely on your own trying to solve a problem. This month, we'll take a look at how, with REXX, you're never completely helpless.

Our discussion will be based on the following .cmd file template:

```
/* TEMPLATE.CMD */
call RxFuncAdd,
'SysLoadFuncs', 'RexxUtil',,
'SysLoadFuncs'
call SysLoadFuncs
/* insert code here! */
exit
```

This template registers all the extended built-in functions that are available in a file called *rexutil.dll*, making them available from your REXX code. For an explanation of what these lines do, see the sidebars on pp. 60 and 61. Now, let's take a look at one possible scenario.

When was that file created?

You recall having saved a file sometime in August 1993 containing a phone number in the 303 area code that's suddenly become very important to you. Listing 1 shows how to find it using REXX.

The function **SysFileTree** collects information on all files in all subdirectories (denoted by the **FS**, respectively, in the third param-

**The code
executes a do instruc-
tion that parses each
line into a date, time,
size, set of attributes,
and file name.**

ter) and assigns them to a compound symbol stem we called **file** that will act as an array to hold all the found files. The element **file.0** contains the number of elements in the array. Put another way, **SysFileTree** will result in some number of lines of output. The first line is stored in **file.1**, the second in **file.2**, and so on, with the overall number of lines stored in **file.0**.

The code executes a **do** instruction that parses each line into a date, time, size, set of attributes, and file name (including path).

Listing 1: Finding a text string.

```
/* code to insert */
call SysFileTree 'c:\*.*', file, 'FS'
do i=1 to file.0
  parse var file.i date,
                    time,
                    size,
                    attr,
                    name
  name = strip(name)
  if date >= "8/1/93" & date <= "8/31/93" then do
    call SysFileSearch '303', name, 'found'
    if found.0 \= 0 then
      say date name || ':'
    do n=1 to found.0
      say found.n
    end /* do */
  end /* if */
end /* do */

/* end of code to insert */
```


Listing 2: Deleting files with a common extension.

```
/* code to insert */
call SysFileTree 'd:\*.foo', fooFiles, 'FSO'
if fooFiles.0 = 0 then
  say 'No files found'
else do i=1 to fooFiles.0
  say 'deleting' fooFiles.i
  rc = SysFileDelete(fooFiles.i)
  select
    when rc = 5 then
      say fooFiles.i || ': Access denied'
    when rc = 32 then
      say fooFiles.i || ': Sharing violation'
    otherwise if rc \= 0 then
      say fooFiles.i || ': Error' rc
  end /* select */
end /* do */
/* end of code to insert */
```

Note that this instruction spans five lines and that each of the first four lines end in a comma. In REXX, a comma at the end of a line acts as a continuation character. REXX replaces the comma

with a blank space and treats the next line of code as a continuation of the current line.

After parsing, the name is stripped of leading spaces and the date is checked to see if it is in the

**Say you
wanted to delete all
files with an extension
of .foo from all subdi-
rectories on your d:
drive**

critical period. If it is, a call is made to the **SysFileSearch** function, which takes the string to search for (in this case, "303"), the file name to search, and a compound symbol stem we called **found**. As before, **found** represents an array corresponding to every instance of the search string found in the file, with **found.0** representing the number of such instances.

If a file dated within our range contains the string we're looking for, the date and file name are output to the screen, and each found string is output.

Variation on a theme

The **SysFileTree** function allows you to search your disk for files only (as in our example), for directories only, or, by default, for files and directories. You can specify whether to search through subdirectories (as we did) or not, and whether to return date, time, and so on about a file (as we did) or simply the file path and name.

For example, let's say you wanted to delete all files with an extension of .foo from all subdirectories on your d: drive, as shown in Listing 2.

Here, the **O** option in the third parameter says to merely get file names. Then, for each file found by the call to **SysFileTree**, the **do** instruction announces deletion of

REXXUTIL.DLL

The *rexxutil.dll* file provides OS/2 users of REXX with over two dozen additional functions that include screen manipulation, operations with files and drives, and the ability to manipulate Workplace Shell objects.

Many of the functions do much the same thing as OS/2 commands. For example, the functions **SysMkDir** and **SysRmDir** create and remove directories, respectively. Why use them, then? Because they have better exception handling than the OS/2 command equivalent. For example, say you have the following line of code in a REXX command file:

```
MD C:\FUBAR
```

If the subdirectory already exists, you'll get an error message on the screen, but the *.cmd* file will continue to execute! Coding the line as

```
rc = SysMkDir('C:\FUBAR')
```

will result in a return code being assigned to the variable **rc**. If **rc** is zero, for example, the call was successful; if it is five, access was denied. Subsequent code can check **rc** and take appropriate action.

You can find out more about all the functions in *rexxutil.dll* by viewing the *rexx.inf* file on your machine.

REXX and DLLs

Most of REXX resides in dynamic link libraries (DLLs). DLLs are files that contain executable code packaged as functions. The code in DLLs can be called from processes running under OS/2. For example, the REXX interpreter and the built-in functions and instructions are packaged in a file called *rexx.dll*. Additional OS/2 REXX functions are packaged in *rexxutil.dll* (discussed in the sidebar on p. 60). DLLs are one way that multiple OS/2 processes can share resources; If two processes are running REXX command files, they will both use *rexx.dll*, which is loaded automatically.

DLLs can provide REXX users with much functionality. And, while you can't create DLLs using REXX, it's quite simple to make use of DLLs in your REXX code by using the built-in **RxFuncAdd** function. Let's look at the function call from the code in the main part of the column:

```
call RxFuncAdd
  'SysLoadFuncs',
  'RexxUtil',
  'SysLoadFuncs'
```

This line of code registers a function called **SysLoadFuncs**. Once registered, this function will now be accessible from REXX. The remaining two parameters in the function call indicate that the function is found in the *rexxutil.dll* under the name **SysLoadFuncs**. (This practice may look redundant, but a function in a DLL can be registered using different names in REXX, with the result that a function in a DLL may act as an "entry point" for two or more REXX functions.)

It turns out that **SysLoadFuncs** is a function that, when called from REXX, registers all the other functions in the DLL without you having to know about it. That's the reason for the next line of code:

```
call SysLoadFuncs
```

These two lines of code register all the functions in the *rexxutil.dll* file. If your code only makes use of one function from that DLL (for example, **SysFileTree**), you can register just the one function with the following line of code:

```
call RxFuncAdd
  'SysFileTree',
  'RexxUtil',
  'SysFileTree'
```

the file, followed by a call to **SysFileDelete**. The return code from **SysFileDelete** is then examined to see whether an error occurred while trying to delete the file and, if so, a message is sent to the console.

SysFileTree is more involved than we can cover here. I'll just mention that you can search for and set file attributes in addition

to the functions we've discussed. The *rexx.inf* file contains complete information about **SysFileTree** (not to mention the rest of REXX).

Alex Lane is a consultant and writer, and a contributing editor to OS/2 Magazine and AI Expert. He can be reached at CompuServe 75715,1370, or Internet as alex.lane@springs-board.org.

Your One Stop for OS/2 Backup...

BakupWiz

OS/2 BackupWiz is the SCSI tape backup solution you have been looking for! Designed to exploit OS/2's multiple threading, BackupWiz gives you a quick and reliable method to completely back up your OS/2 system. HPFS and FAT file systems are supported and Extended Attributes, Long File Names, System files, and the Workplace Shell are backed up. You can even restore your entire OS/2 boot volume from tape!

Ease of use is another of OS/2 BackupWiz's strong points. A simple, character oriented menu interface and command line operation are provided. OS/2 BackupWiz comes with support for most 1/4", 4mm (DAT), and 8mm tape devices. BackupWiz can also backup to other hard drives, file servers, minis/mainframes via TCP/IP, and removable drives including Bernoulli, Syquest, diskette, and magneto optical. There is even a version of OS/2 BackupWiz that supports many of the automatic tape changer mechanisms. Any SCSI host adapter that has an ADD driver can be used with OS/2 BackupWiz.

PCX also works hard to keep you satisfied after the sale with outstanding customer support. Being a small and aggressive company means that we can respond to your needs that much quicker.

OS/2 BackupWiz is priced at \$149 (autochanger version \$399). PCX also has a **competitive upgrade program** where you can purchase OS/2 BackupWiz for just \$49 by sending in an eligible competing product. We offer a 30 day money back guarantee to protect you in case OS/2 BackupWiz does not work for you! Call our toll free number and order today!



PortaTape

PortaTape is your complete portable tape backup solution for OS/2. Using high speed SCSI tape devices, the PortaTape line offers capacities ranging from 250 megabytes to 10 gigabytes. Offering backup speeds from 6 to over 18 megabytes per minute when using a high speed, bidirectional printer port, units in the PortaTape series are priced from \$995.

Members of the PortaTape series utilize a range of SCSI tape drives including 1/4 inch, 4mm, and 8 mm mounted in low profile external enclosures. Connection to the host system is via the system's parallel printer port, which may be utilized concurrently with tape drive operation. A copy of OS/2 BackupWiz is included with each PortaTape.

PCX also markets a complete line of standard SCSI tape backup units ranging in capacity from 250MB to over 10GB. Available in both internal and external models, these units are priced from \$550. For very large backup needs, PCX offers robotic tape loader mechanisms from 48GB to over 1 terabyte.

FOR MORE INFORMATION OR TO ORDER CALL:
1-800-800-4PCX

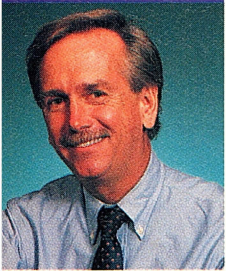
PCX 3525 Del Mar Heights Road, Suite 313, San Diego, CA 92130 • (619) 259-9797 • (619) 481-6474 FAX

Shipping is non-refundable. No cancellations on special order items. 20% restocking fee on hardware refunds within 30 days. No refunds or exchanges after 30 days. Prices subject to change.





Reader Service No. 29



Learning more about OS/2

OS/2 EDUCATION COMES IN A VARIETY OF FLAVORS BY DICK CONKLIN

An OS/2 user is a student from day one—from the first demonstration, to buying the product, installing it, and beginning to explore its features. Further education comes in a variety of formats and topics, ranging from OS/2's own built-in tutorial to a week-long course in programming.

In the February issue ("Information Center," pp. 78-79), we listed books on OS/2 for people who prefer to go the low-cost read-it-yourself route. Table 1, in this column, lists more formal sources of OS/2 education. In the self-study arena, you'll find computer-based training (CBT), on-line courses, and video and audio cassettes.

Hundreds of instructor-led classroom courses are offered on OS/2

topics. Some are taught in facilities owned by the course provider and most can be brought on-site if your company needs mass training. Some of the courses listed in Table 1 quote a per-student tuition rate and others a per-class rate. In most cases, a course provider can bid on a custom package that meets your needs. Some make their course materials available or offer teach-the-teacher classes for people who want to do their own in-house training. We've listed only OS/2 topics here, but most providers offer courses in related topics, such as OS/2 applications, local-area networks, PC hardware, support, and a variety of programming topics.

If you want to create your own computer-based training or on-

line tutorials, I suggest that you look into OS/2's Information Presentation Facility (IPF). IPF files can be created with text and graphics with the ability to branch to selected topics. All you need to start an IPF session is OS/2's built-in VIEW command. IPF authoring tools are part of the Developer's Toolkit for OS/2 and the IBM Developer's Connection CD-ROM. The IPF Guide and Reference publication can be ordered from IBM as S10G-6262.

Dick Conklin is editor-in-chief of OS/2 Developer, contributing editor to OS/2 Magazine, and author of three OS/2 books. He can be reached at CompuServe 76711,1005 or Internet os2mag@vnet.ibm.com.

Table 1: OS/2 courses offered by various providers.

For more information, contact the companies directly. Tuition amounts are per-person in U.S. dollars (unless otherwise noted).

Company:	Contact Information:	Class locations:	Course Name	Days	Tuition	Code
Adaptive Research & Design	Tel: (305) 899-0070	Miami, Fla.	OS/2 Getting Started, User Course	1.0	\$295	
	Fax: (305) 892-8669	or on-site.	OS/2 Administrator's Course	2.0	\$795	
	READER SERVICE NO. 167		OS/2 LAN Server 3.0 for Administrators	3.0	\$1,195	
			Advanced LAN Server: Advanced Performance Tuning	2.0	\$895	
			REXX Programming	2.0	\$895	
			ANSI C Programming	4.0	\$1,595	
			OS/2 Presentation Manager Programming in C	5.0	\$1,995	
			OS/2 Multimedia Programming	5.0	\$1,995	
Computer Workshop	Tel: (708) 971-0004	On-site, Ill.	OS/2 Training - Introduction	1.0	\$195	
	(312) 441-2770					
	Fax: (708) 971-0065					
	READER SERVICE NO. 168					

Information Center

Company:	Contact Information:	Class locations:	Course Name	Days	Tuition	Code
Dill & Company						(per class)
	Tel: (817) 491-2147	on-site, U.S.	OS/2 and PM Programming Using Micro Focus COBOL 4.0		\$2,800	
	72370.251@CompuServe.Com					
	READER SERVICE NO. 169					
G. F. Gargiulo & Associates						(per class)
	Tel: (800) 254-5578	On-site, U.S.	Programming in OS/2 REXX	4.0	\$4,000	
	(203) 646-9531					
	Fax: (203) 646-2408					
Huffman & Associates						
	Tel/Fax:	On-site, Calif.	How to Use OS/2	1.0	\$150	
	(805) 461-1053 central coast.					
	71542.2361@compuserve.com					
Infotec Training Institute						
	Tel: (800) 282-7990	Southern Calif.,	OS/2 for Users	2.0	\$430	
	(714) 755-7120 San Francisco,					3.0 \$645
	Fax: (714) 755-7155 and Seattle, Wash.					5.0 \$1,075
IS International Inc.						
	Tel: (407) 994-4373	South Fla. or	Introduction to OS/2 2.x PM Programming Using C	4.5	\$1,350	
	Fax: (407) 994-8374 on-site worldwide.					4.5 \$1,350
	READER SERVICE NO. 173					
KnowHow Solutions						
	Tel: (818) 597-9176	Computer-based	Understanding OS/2		\$90	
	Australia:					
	(61) 2-907-9013					
Mark Minasi & Company						
	Tel: (703) 276-8940	Washington, D.C.	Supporting OS/2 (taught in Washington, D.C. area)	2.0	\$795	
	Fax: (703) 276-1014 and on-site					2.0 \$5,000
	READER SERVICE NO. 175					

Information Center

Company:	Contact Information:	Class locations:	Course Name	Days	Tuition	Code
OneOnOne Computer Training	Tel: (800) 424-8668	Self-paced	How to Use OS/2, 2.x (audio cassette)	1.0	\$195	
	(708) 628-0500	(audio).				
	Fax: (708) 628-0550					
	READER SERVICE NO. 176					
One Up Corp.	Tel: (800) 678-0187	On-site worldwide. OS/2 Application Migration Workshops: Call for information (customized to customer's requirements).				
	(214) 620-1133					
	Fax: (214) 620-8218		OS/2 Basics for End Users	1.0	Call	A101
	READER SERVICE NO. 177		Installing, Using and Customizing OS/2	3.0	Call	A102
			OS/2 Technical Support	2.0	Call	A103
			C Language Programming	5.0	Call	A110
			C++ Programming	5.0	Call	A115
			OS/2 and PM Programming	5.0	Call	A120
			Advanced OS/2 and PM Programming	5.0	Call	A121
			SOM WPS Programming for OS/2	5.0	Call	A125
			OS/2 LAN Server Administration	5.0	Call	A201
			DB2/2 Administration	4.0	Call	A401
PC Clean	Tel: (800) 881-6897	Fort Lauderdale,	Up and Running with OS/2	1.0	\$249	
	(305) 748-9977	Fla. or on-site in				
	Fax: (305) 748-9991	South Fla.				
	READER SERVICE NO. 178					
PC Dialogs					(per class)	
	Tel: (212) 663-3459	On-site, N.Y.	OS/2 2.x Fundamentals	2.0	\$3,000	
	bpesner@panix.com	Metro area.	OS/2 2.x for the Support Team	2.0	\$3,000	
	READER SERVICE NO. 179		C Programming for OS/2	5.0	\$7,500	
			OS/2 Kernel Programming	5.0	\$7,500	
			OS/2 PM Programming - Basic	5.0	\$7,500	
			OS/2 PM Programming - Advanced	5.0	\$7,500	
			OS/2 System Object Model Programming	3.0	\$4,500	
			Basic IBM LAN Server Administration	3.0	\$4,500	
			Advanced IBM LAN Server Administration	5.0	\$7,500	
			Communications Manager/2 Configuration	3.0	\$4,500	
			OS/2 EHLLAPI Programming	2.0	\$3,000	
			Advanced Program-to-Program			
			Communication Programming	5.0	\$7,500	
			TCP/IP for OS/2 Concepts and Administration	2.0	\$3,000	
			OS/2 REXX Programming	3.0	\$4,500	
			VX-REXX Programming	5.0	\$7,500	
Productivity Point International	Tel: (800) 848-0980	Multiple U.S. &	OS/2 2.1 Introduction	1.0	\$250	
	(708) 920-0980	Canada training	OS/2 2.1 Advanced	1.0	\$250	
	Fax (708) 920-1042	centers and	OS/2 Comm Manager	1.0	\$250	
	READER SERVICE NO. 180		OS/2 LAN Concepts	0.5	\$125	
		on-site.	OS/2 LAN User	0.5	\$125	
			OS/2 Query Manager	2.0	\$500	

Information Center

Company:	Contact Information:	Class locations:	Course Name	Days	Tuition	Code
						(UK Pounds)
QA Training	Tel: (44) 285-655888 or 641052 Fax: (44) 285-650537 READER SERVICE NO. 181	U.K. and on-site worldwide.	Introduction to OS/2 2.x	1.0	£240	
			Supporting OS/2	4.0	£960	
			Supporting OS/2 Communications Manager	4.0	£760	
			OS/2 and Presentation Manager Programming	5.0	£1195	
			OS/2 APPN and APPC Cooperative Programming	4.0	£1175	
			Supporting IBM DB2/2	3.0	£750	
QED Information Sciences, Inc.	Tel: (800) 343-4848 (617) 237-5656 Fax: (617) 235-0826 READER SERVICE NO. 182	Boston, Philadelphia, Cleveland, and on-site.	OS/2 System Overview	2.0	\$695	
			OS/2 for End-Users	3.0	\$995	
			OS/2 System Support	2.0	\$695	
			OS/2 Rexx	3.0	\$995	
			OS/2 Presentation Manager	5.0	\$1,395	
			OS/2 DB2/2	5.0	\$1,395	
SE International, Inc.	Tel: (800) 473-4685 (407) 278-2204 Fax: (407) 278-3919 READER SERVICE NO. 183	Boca Raton, Fla. or on-site.	GUI Application Development with PM and C	5.0	\$1,875	
			GUI Application Development with PM and Gpf	5.0	\$1,350	
			Advanced GUI Programming with Gpf	3.0	\$1,135	
			System Object Model / Workplace Shell Programming	5.0	\$1,875	
Skill Dynamics, an IBM Company	Tel: (800) 426-8322 Extension 1630 Fax: (800) 426-9006 *Call for pricing and complete descriptions. READER SERVICE NO. 184	IBM and Skill Dynamics centers and on-site.	OS/2 DCE Administration Workshop	4.5	\$1,800	G3835
			OS/2 LAN Requester User Workshop	0.5	\$125	G4161
			OS/2 LAN Server Planning and Installation Workshop	2.0	\$600	G4370
			OS/2 Communications: Networking	3.0	*	G4500
			OS/2 Communications: Networking Workshop	4.0	\$1,440	G4501
			OS/2 LAN Server Administration Workshop - I	3.0	\$900	G4360
			OS/2 LAN Server Administration Workshop - II	5.0	\$1,600	G4560
			Integrating NetWare and OS/2 LAN Server	2.0	\$795	G4570
			OS/2 LAN Server Performance Workshop	4.0	\$1,300	G4760
			Printing with OS/2	1.0	*	K2517
			Introduction to C Programming - DOS and OS/2	4.5	\$1,340	K3604
			Advanced C Programming - DOS & OS/2	4.5	\$1,440	K3605
			C++ Language for DOS	4.5	\$1,335	K3606
			SOMObjects Developer Toolkit Workshop	3.0	\$1,250	N1602
			Developing Help and on-line Documents Using OS/2 IPF	3.0	\$750	N1680
			Presentation Manager 2.x for Software Developers	5.0	\$1,575	N1688
			SAA CUA User Interface Design for OS/2 Environment	2.0	\$600	N1735
			OS/2 2.x for Software Developers	5.0	\$1,575	N1740
			Presentation Manager Device Drivers	5.0	\$1,575	N1742
			OS/2 Problem Diagnosis and Resolution Workshop	5.0	\$1,575	N1743
			Presentation Manager: Windowing and Graphics	5.0	\$1,575	N1744
			Workplace Shell Programming with SOM	5.0	\$1,575	N1745
			OS/2 2.x for 1.x Developers	5.0	\$1,575	N1746
			OS/2 Kernel Debugging	4.0	\$1,260	N3052
			DB2/2 Query Manager Workshop	2.0	\$630	P1046
			OS/2 Extended Services Database Coding Workshop	3.0	\$1,050	P1048
			OS/2 Database Performance Workshop	4.0	\$1,500	P1054
			Database 2 OS/2 Database Administration	4.0	\$1,500	P1056

Information Center

Company:	Contact Information:	Class locations:	Course Name	Days	Tuition	Code
Skill Dynamics (continued)			OS/2 V2.0 Problem Determination Servicer Training	4.0	\$1,500	P1063
			OS/2 DCE for Software Developers	5.0	\$1,800	P1064
			REXX Programming for OS/2	3.0	\$975	P1066
			OS/2 V2 PM Programming Using C++ and ICL:UI	4.5	\$1,485	P1067
			OS/2 2.1 User Workshop	1.0	\$225	P1069
			Using and Customizing OS/2 2.1	2.0	\$490	P1070
			Installing and Supporting OS/2 2.1	3.0	\$900	P1071
			OS/2 2.1 Advanced Support Workshop	2.0	\$630	P1072
			C Programming for OS/2 PM	5.0	\$1,575	P1073
			Base OS/2 Programming	3.0	\$885	P1076
			Introduction to OS/2 PM Programming	5.0	\$1,625	P1077
			OS/2 PM Application Development	5.0	\$1,625	P1078
			OS/2 2.1 Performance and Tuning Workshop	2.0	\$680	P1081
			OS/2 PD/PSI (Hang/Trap analysis) on Software Problems	4.5	\$1,400	P1082
					(per class)	
21st Century Training Corporation	Tel: (908) 739-1010	On-site,	OS/2: A Manager's Overview	1.0	\$1,250	
	Fax: (908) 739-1876	worldwide.	OS/2 Navigation	1.0	\$1,250	
	<i>equinn@palace.com</i>		OS/2 Fundamentals	2.0	\$2,500	
	READER SERVICE NO. 185		OS/2 Fundamentals for Technical Staff	2.0	\$2,500	
			OS/2 Installation, Implementation and Support	2.0	\$3,000	
			OS/2 LAN Requester: Fundamentals	1.0	\$1,500	
			OS/2 LAN Server: Administration	2.0	\$3,000	
			OS/2 LAN Server: Advanced Topics	3.0	\$4,500	
			OS/2 Database Manager (DB2/2) Workshop	3.0	\$4,500	
			OS/2 Communication Manager Overview	1.0	\$1,600	
			OS/2 Communication Manager Workshop	3.0	\$4,800	
			OS/2 REXX Programming	1.0	\$1,500	
			OS/2 Client-Server Programming	2.0	\$3,000	
			OS/2 Kernel Programming in C/C++	5.0	\$7,500	
			Basic OS/2 Presentation Manager Programming in C/C++	5.0	\$7,500	
			Advanced OS/2 Presentation Manager Programming in C/C++	5.0	\$7,500	
			Designing SAA/CUA Applications	2.0	\$3,000	
			Introduction to OS/2 Program Design	2.0	\$3,000	
			OS/2 Kernel Programming in COBOL	5.0	\$7,500	
			OS/2 Presentation Manager Programming in COBOL	5.0	\$7,500	
			Introduction to Smalltalk Programming	5.0	\$8,750	
ViaGrafix Corporation				(minutes)		
	Tel: (800) 842-4723	Self-paced video.	Getting Started with OS/2	54	\$40	
	(918) 825-6700		Productivity with OS/2	87	\$50	
	Fax: (918) 825-6744		OS/2 for your LAN	82	\$60	
	READER SERVICE NO. 186		Optimizing OS/2 for Hot Performance	47	\$40	
Wave Technologies Training			Set of four videos	270	\$160	
	Tel: (800) 828-2050	Multiple U.S.	OS/2 2.1: The Next Generation	2.0	\$795	
	E-mail: 73361.544@compuserve.com	locations.				
	READER SERVICE NO. 187					

Advertising Index

Reader Service No.	Company	Page
17	Clear & Simple	27
11	Compu Expo	17
16	Computer Interface Corp.	27
5	Corporate Info Management	8
13	Creative Systems Programming	38
36	CSN Inc.	74
2	Demand Software Services	2
6	Development Technologies Inc.	9
30	Footprint Software	71
32	FTG Data Systems	C3
28	Hockware	58
	IBM Person to Person	12
	IBM DB/2	C2
	IBM	26
	IBM Object Oriented Technology	49
	IBM PSP	75
24	Indelible Blue Inc.	42
34	J&J Computer Consulting	74
18	Levine Computer Consulting	29
33	Manufacturers Rep	74
10	MHR Software and Consulting	16
20	Microgate Corp.	36
15	Mitnor Software	25
13	MSR Development	21
37	North Shore Systems	74
26	Nova Stor	54
35	Office Solutions	74
27	One Up Corp.	56
4	OS/2 Vendor Council	6
19	OS/2 World Conference	35
29	PCX	61
25	Pro Engineering	45
9	Share Headquarters	14
3	SofNet	5
14	Softbridge Inc.	25
7	Softmart	10
12	SofTouch Systems Inc.	18
31	Sundial Systems Corp.	C4
38	The Software Lifeline	74
21	Tritus Inc.	36
22	Van Nostrand Reinhold	37

The information on this page is provided as a service to our readers. The publisher will assume no liability for errors or omissions.

Can't I have One package that does Everything?

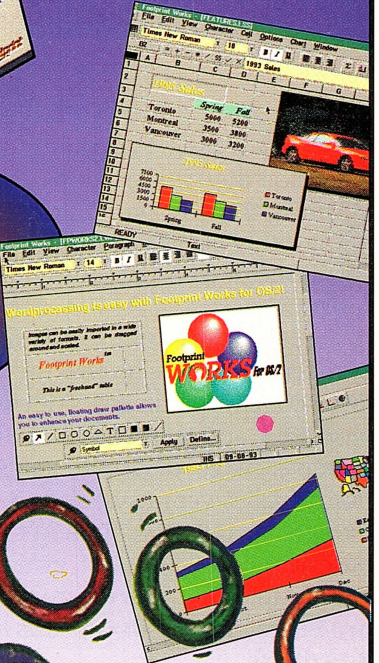
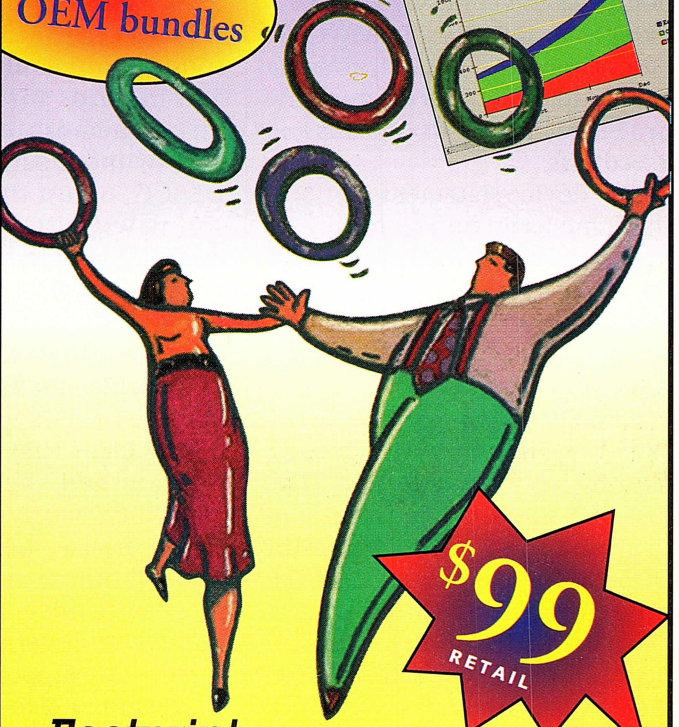
Yes, you can!



- Word Processing
- Spreadsheets
- Charting
- Data Filer
- Report Writer

Cost effective solutions for corporate site licenses

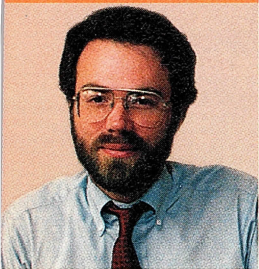
Available for OEM bundles

\$99
RETAIL

Footprint WORKS™ For OS/2

1-800-465-8470
Fax: 416-860-1780



How *config.sys* helps OS/2 control hardware

DEVICE, BASEDEV, AND IFS OH MY! BY MARK MINASI

In the last issue, I started to take a look at the *config.sys* file by examining the **set** commands. This month, I'll continue by focusing on the **device**, **basedev**, and **ifs** commands.

Once the SET statements have been removed, I can see that my *config.sys* contains a number of **device=**, **basedev=**, and **ifs=** statements. For example, I've got **device=mouse.sys**, **pointdd.sys**, **vcom.sys**, and so on. I've got **basedev** statements like **basedev=ibm1s506.add**, and **aha154x.add**. We'll also examine the two **ifs** statements, **ifs=hpfs.ifs** and **ifs=cdfs.ifs**.

The **device** statements perform the same basic function they do under DOS—they load a device driver. As to what, exactly, a device driver is, let's briefly go back in time to 1983, when DOS 2.0 was under construction.

DOS 2.0 was the first "modern" DOS, meaning it was the first one built by Microsoft and IBM. (The first DOS was basically farmed out to a contractor.) Microsoft built DOS 2.0 for the power PC of the time. In 1983, a PC might have had a pair of floppy drives, a hard disk under 32MB, a text-based video subsystem of some kind, parallel ports, serial ports, and a U.S.-type keyboard. But Microsoft knew the microcomputer world changes rapidly and they wanted DOS to be able to support new

**The idea was
that a device driver
was a kind of back door
for DOS expansion.**

devices without major revisions to the DOS kernel. As funny as it sounds, you couldn't run many add-in cards for the PC—hard disks, memory cards, and the like—without patching DOS with DEBUG, or just throwing out the shrink-wrap DOS altogether and replacing it with one supplied by the manufacturer. The idea was that a device driver was a kind of back door for DOS expansion.

Consider the kinds of devices you see on PCs today and it becomes clear that Microsoft was right to add the device driver capability. Nearly every PC today has a mouse, but DOS has no built-in mouse-support—a separate device driver is needed. OS/2 has device driver support for two reasons: to support new kinds of hardware and to support variations within hardware types. In the first case, imagine that someone invented a three-dimensional pointing device. Such a device's driver would have to tell the OS/2

system how to read the signals coming from the pointing device, then provide a programming interface that allowed applications to be written for it. You see, calls in the OS/2 API will handle a two-dimensional pointing device, but not a three-dimensional device. So, the device driver would have to provide a whole new API for this new pointing device.

The second kind of device driver does not necessarily support a new kind of hardware. Instead, it handles the variation within a hardware type. For example, OS/2's support for particular types of mice is not built into the operating system, simply because so many different mice exist.

Speaking of mice, a number of drivers in *config.sys* are relevant to them. *Pointdd.sys*, *mouse.sys*, and *vmouse.sys* are the names of the mouse drivers on my system (yours may have different names if you don't have a Microsoft mouse). *Pointdd.sys* supports the pointing device, as I explained a paragraph or two back, *mouse.sys* supports the Microsoft mouse itself, and *vmouse.sys* is a virtual mouse driver.

Virtual drivers are some of the foundations of OS/2's DOS support. The DOS programs that OS/2 runs are built with a somewhat solipsistic view of the world. DOS programmers build DOS programs

to use the system's hardware with no consideration of other programs. Left to themselves, the DOS programs that run under OS/2 would all write to the screen at the same time, causing a video mess. They would grab each other's keystrokes making issuing commands a challenge and they'd all send output to the printer simultaneously, leading to a kind of "document integration" that I don't think anyone intended.

To combat that problem, OS/2 gives each DOS program a "virtual PC" to work with. OS/2 builds these virtual PCs out of "virtual devices," which are, essentially, pieces of software that act as pieces of hardware. For example, most DOS programs poll the keyboard constantly, trolling for keyboard input. OS/2 should allow DOS programs in the foreground access to the keyboard but DOS programs in the background will never find a keystroke waiting for them. OS/2's virtual keyboard driver is just a small program that, when you're in the foreground and you poll the keyboard, gives you actual access to the keyboard; but if you're in the background, it answers all your "are there any keystrokes for me?" queries with "no."

OS/2 includes virtual keyboard, video, disk, and other drivers. Your OS/2 *config.sys* may contain VEMM (a virtual expanded memory driver), VXMS and VDPMI (virtual drivers to allow access to extended memory), VCOM (serial port support), VCDROM, and VSVGA (support for CD-ROM and super VGA).

Dos.sys first appeared in OS/2 1.2. At the time, Microsoft said it enabled OS/2 to swap out the single DOS session (OS/2 1.x could only run one DOS program at a time) to disk, something that OS/2 1.0 and 1.1 couldn't do. *Testcfg.sys* runs a quick inventory of your hardware to check driver compatibility, which is most important when you've got SCSI devices.

Com.sys enables the serial ports. For some reason, OS/2 has always supported parallel ports right in the base system, but you must load serial-interface support separately.

Config.sys contains several statements that begin with **basedev**= that first appeared in OS/2 2.0. **basedev** statements load programs that are somewhat like the BIOS under DOS in that they're low-level device-control programs of fundamental importance to the system. The *ibm1s506.add* file supports your hard disk, if you've got an ISA bus PC. S506 refers to the type of disk-interface most commonly found on ISA bus machines, the Shugart Technologies 412/506 hard-disk interface. (OS/2 owners running OS/2 on a Micro Channel machine do not have this driver.) People who used OS/2 2.0 on an ISA bus machine often noticed that their hard disks ran slowly but noisily and their disks emitted grunts and groans that they'd not emitted under DOS. In response, IBM quickly put a revision of *ibm1s506.add* on CompuServe and on IBM's bulletin board. If you have a SCSI host adapter on your system, you'll see *os2scsi.add*, a general OS/2 SCSI manager. In addition, you'll have a **basedev** for your particular SCSI host adapter. For example, my Adaptec 1742 uses the *aha17xx.add* or *aha154x.add* driver, depending on whether it's running in enhanced mode or standard mode.

The **ifs** statements support OS/2's Installable File System (IFS). Under IFS, vendors can write drivers to allow OS/2 to support new file systems.

OS/2's default file system—the one that's supported in the kernel—is the familiar File Allocation Table (FAT) system. The FAT is familiar, but it's limited by its 8.3 file-naming conventions, miserably laid-out file allocation information (there's a backup for the FAT itself, but the backup sits phys-

ically next to the primary FAT; as a result, anything that impacts the primary FAT usually affects the backup FAT as well), clunky space-allocation system, and other "features" too numerous to mention here. OS/2 doesn't require that you live with the FAT, however, and includes support for an optional file system called the High Performance File System (HPFS). If you're using HPFS, then the line **ifs=c:\os2\hpfs.ifs** must be in your *config.sys* or OS/2 won't be able to recognize your hard disk. In contrast, however, if you're not using HPFS, you should remove that line from your *config.sys*, because the *hpfs.ifs* driver takes up about 500K of memory.

If you have a CD-ROM—and you should, because the whole world's going CD-ROM—then you'll also have an **ifs=cdfs.ifs** statement in your *config.sys*. DOS only adds a TSR that slaps CD-ROM support onto the side of the existing operating system, while the IFS feature of OS/2 makes it possible for OS/2 to build CD-ROM support right into the operating system.

The **device**, **basedev**, and **ifs** statements in *config.sys* allow you to configure OS/2 so that it can work with virtually any 386-based PC configuration. Loading BIOS-like code from **basedev** makes it easy to perform the equivalent of a BIOS upgrade without screwdrivers, **device** allows OS/2 to support a wide variety of new devices, and **ifss** makes OS/2 able to present non-standard storage devices, like LANs and CD-ROMs, with the same interface that standard disks receive.

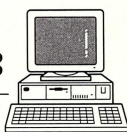
Mark Minasi has been a consultant and educator in the fields of advanced PC operating platforms and PC technology since 1984. He is a contributing editor for *Compute*, *BYTE*, and *OS/2 Magazine*. You can contact him at CompuServe 71571,264 or Internet mminasi@access.digex.net.



Marketplace

Introducing...

OS/2 Products from One Resource:



MFG'S REP CO.
Call 800 808-4-OS/2

**Word Processing
Spreadsheets
Graphics** **Utilities
Networking
Development**

Full Service Sales.
We carefully evaluate the
software we sell. You get the
benefits of our trials!

Mfg's Rep Co. • P.O. Box 7626
Burlingame CA • 94011-7626
Fax (415) 525-2707
Tel (415) 525-2700 or
(800) 808-4-OS/2 [4672]

Reader Service No. 33

the J&J Utilities for OS/2 Release 1.5

- X Easy-to-use PM interface.
- X Full command line support.
- X Defrag FAT and HPFS disks.
- X See all running processes.
- X Kill unwanted "run-away" jobs.
- X Search for files and text.
- X Flexible job scheduler.
- X Run apps at crit, high, idle.
- X Delbut, deltree, disk info.
- X Much, much more!
- X Multithreaded 32-bit code.

\$49.95

J&J Computer

Call 405-624-1472 fax 405-743-1613



Reader Service No. 34

America's OS/2 Store

- we stock a complete line of OS/2 and Windows applications
- supported by Team OS/2 members
- same day shipping
- all major credit cards accepted
- 8 years of quality service

OFFICE SOLUTIONS
404 Termino Ave.
Long Beach, CA 90814



TO ORDER CALL 1-800-897-APPS

Reader Service No. 35



Lan Server 3.0 Administrators! now ...

- **Track** performance and capacity
- **Analyze** activity with graphs and charts
- **Anticipate** capacity and performance needs

WATCHIT

"make your server serve"



CSN Inc
Po Box 370111
W.Hartford, CT
06137-0111
(203) 233-2951



Reader Service No. 36

CursorPower™

Want this or this for your OS/2 and Windows pointer instead of or more of these



Knowledgeable users do! Use ours or draw your own.

Regular retail price \$89.95

Special intro price of \$49.95

Includes **CursorPower** for OS/2 and Windows on the same disk.

Winner of IBM's OS/2 Software Developers Award

North Shore Systems, Inc.
(702) 831-1108

Reader Service No. 37

REMOTE-OS Multiuser for OS/2

Reap the benefits of a seamless enterprise with REMOTE-OS' multiuser OS/2 Solution.

Under REMOTE-OS, your existing LANs, DOS, OS/2 or Windows workstations, MACs and various ASCII or 3270 terminals can access the OS/2 local or remote servers to run OS/2 or DOS applications. Since each terminal can multitask up to eight sessions, they can also pass through to Mainframes, Midrange and Minis concurrently.

Cut you integration or small business problems down to size...CALL 407-994-4466 and get your enterprise together!

The Software Lifeline, Inc.
Executive Court One
2295 Corporate Blvd.
Boca Raton FL 33431
Fax 407-994-6304 • Voice 407-994-4466

Reader Service No. 38

PERSONAL SOFTWARE PRODUCTS



**Operate At
A Higher Level.™**

SAVE OVER 20%

Video Special

- Getting Started With OS/2\$39.95
- Productivity With OS/2.....49.95
- LAN for OS/259.95
- Optimizing With OS/239.95

Regularly ~~189.80~~

Special Price Only \$149.00!

Item No. 1296

**For Easy Ordering
Call 1-800-342-6672
and Ask For Item No. 1296
(9 A.M. to Midnight Mon.- Fri.
9 A.M. to 9 P.M. Sat., EST)**

**To Receive Your Free Catalog
of Additional OS/2 Products
Call Toll-Free 1-800-342-6672**



©1993 IBM Corp. All Rights Reserved. IBM and OS/2 are registered trademarks and Personal Software Products and "Operate At A Higher Level" are trademarks of International Business Machines Corporation. All other names and logos are (registered) trademarks of their respective companies.

I.D. #J9

IBM
®

Tips & Tricks cont'd from p. 78

A: Besides knowing how the PCMCIA drivers work and fit together, you should know about some specifics on how the drivers load and how they interact with each other and with OS/2. The most common problem getting PCMCIA cards to work is the ordering of the device driver statements in *config.sys*.

There is no hard-and-fast rule for ordering these statements, since the drivers vary between card and computer manufacturers in general (I'm including *com.sys* here as well because modems are typical PCMCIA cards).

You should also be aware of some other aspects of PCMCIA. First, each computer and set of drivers are different. I would suggest giving the installation programs and instructions for these drivers a try first. If it doesn't work, then try this ordering:

- 1) *Pcmcia.sys* (OS/2's Card Services provided by OS/2)
- 2) *Com.sys* (serial-port driver provided by OS/2)
- 3) [Card driver provided with PCMCIA card]
- 4) [Socket Service driver(s) provided with computer]

Another important point is that OS/2 2.1 contained a bug in the *com.sys* device driver. The OS/2 installation program would install *pcmcia.sys*, followed by *com.sys* in *config.sys*.

The bug in the COM driver prevented it from working in this order. If you have OS/2 2.1, you will need to place *com.sys* first. This problem was fixed in the OS/2 2.1 Service Pak and in OS/2 2.11. So, if you have OS/2 2.11 (the Service Pak brings you to 2.11 level), *pcmcia.sys* should come before *com.sys*. If you are installing the Service Pak and have a previously working PCMCIA modem, you must manually swap the statements.

Extended Attributes (EAs) are a file-system construct that allows data to be attached to files

PROAUDIO SPECTRUM

Q: I have a ProAudio Spectrum card, but can't get any sound out of it in a Win-OS/2 session.

A: This problem can usually be fixed by changing *vdmad.386* to **vdmad* in your *system.ini* file, located in the *\mdos\winos2* directory.

INF TO TEXT

Q: I have some INF files that were given to me, but I want to convert them to plain-text files. How do I do this if I don't have the source code?

A: I found a utility program on CompuServe called *infcnb.zip*. It can be found in OS2DF1 forum in Library 7. It will convert *.inf* and *.hlp* files to ASCII text.

EXTENDED ATTRIBUTES

Q: I have a word-processor that allows me to add comments to my files and documents. Are these extended attributes?

A: Extended Attributes (EAs) are a file-system construct that allows data to be attached to files, but aren't actually part of the file itself. Many parts of the operating system use EAs to store specific informa-

tion. A good example is the OS/2 Workplace Shell, which uses EAs to store object information.

Some programs choose to store information, such as comments, to a document in a word-processor as a part of the data file itself, or they can choose to store this extra information in EAs. The application determines how and where this extra information is stored.

Note that DOS and Windows applications do not use EAs because their native environments do not have any type of EA construct. Therefore, any comments or extra data being stored by DOS and Windows programs must be part of the data file itself. Only native OS/2 applications use EAs.

THINKPAD UPDATES

Q: Where can I find the latest code for the IBM Thinkpad series?

A: By code I assume you mean the audio, video, and utility features for the Thinkpads. BIOS and reference partition code updates have been made as well. (The Thinkpad 750 has a RAM loadable BIOS and other models have reference partitions on the hard disk.)

You can find these updates on a regular basis, or learn when new ones become available, in several places. IBM has a bulletin board system available. Other than the phone call, it is free of charge. You can reach the PCCBBS at (919) 517-0001. This system is run by the IBM Personal Computer Company and, in case you have any questions about the latest code, rest assured this system has the latest information. You can also obtain information and code from CompuServe in the Thinkpad forum. Type GO THINKPAD at a CompuServe prompt to access this section. The code is usually maintained in the libraries of this forum.

If you are having problems, it is important to get the latest code as

many of the most common problems, such as suspend/resume on the Thinkpad 750C are resolved by the newer code.

COM PROBLEMS

Q: I'm having some problems with serial communications. I'm not sure if the COM port driver is installing properly. How can I tell if the port of my communications program is causing the problem?

A: You can tell if a communications program is causing the problem or if the port is simply not responding to the program by testing the port using the **mode** command. Many people think the **mode** command is only used to set the number of lines, columns, and colors in a command-prompt window or full screen. The **mode** command can set or query the mode of a device, such as the display, or a port, such as the COM port.

To see if the COM port is responding and if the driver is loaded properly, simply open an OS/2 command prompt, and enter **MODE COMx <Enter>**.

The **x** in this command refers to the COM port you wish to query. If you get a pop-up window with a message that the COM port is not ready, you know you need to fix something with the hardware or the driver. If you see information about the baud rate and so on, you know the driver and the port are set up and loaded properly. You should then check your communications program and its settings.

CLIPBOARD

Q: I have placed data from an application into the clipboard. Can I append other data from another application before pasting it to the destination? Does it depend on the application?

A: No applications have native ability to append data to the clipboard while leaving the current data in the clipboard intact. When data is written to the clipboard, the previous contents are erased. There is nothing you can do about it.

It is possible, however, for a programmer to append data to the current contents of the clipboard, despite the fact that OS/2 does not offer it as a programmer option.

A programmer could offer an append option to the user and, if chosen, the application could read the contents of the clipboard, append that data in his own memory and then write the new combined data back to the clipboard. Doing so, however, probably makes sense only if the data, currently stored in the clipboard, is of the same format as the data that is to be appended. It does not make sense to append metafile data to text data. Assuming the programmer of an application wanted to do it, it is possible.

S3 VIDEO CHIPS

Q: OS/2 2.1 does not have support for S3 boards. Where can I get it?

A: OS/2 2.1 does not contain the video drivers needed to exploit the S3 chipsets, however, this support is available. If you have OS/2 2.1, you can get the S3 drivers for the 801, 805, and 928 chips from the IBM support libraries on CompuServe. A file exists in the OS2SUP forum in Library 17 named *s3_16m.dsk* that is a disk image that has the S3 driver for the aforementioned chips with the necessary support files and installation instructions. You will also need the file *loaddf.zip* from Library 17 that enables you to make an actual disk from the *.dsk* image file.

This package is only needed if you have OS/2 2.1. If you have OS/2 2.11 or OS/2 for Windows, you'll find the S3 drivers in the

package and shouldn't try to install this *s3_16m.dsk* package.

These drivers will enable you to run your S3 board at resolutions up to 1,280x1,024x256, 1,024x768x256, 800x600x65,536 (64k), or 640x 480x16 million color modes.

WRITING TO CD

Q: I have an application that I run from a CD-ROM. When I execute the application, I get a message telling me that it cannot write to the disk. I assume that the manufacturers of this application would know that users can't write to a CD-ROM. What am I doing wrong?

A: Often, applications need to write to temporary files in their course of execution. If you don't have an environment variable set that tells the application where to put the temporary files, it may try to put them in the current directory, which, in your case, is probably the CD-ROM drive.

Try editing your *config.sys* file and adding the following two lines, if you don't have TEMP (or TMP) variable lines in there already:

```
SET TEMP = X:\temp
SET TMP = X:\tmp
```

X: represents the drive on which you wish to put temporary files. Be sure you have created the *x:\tmp* and *x:\temp* subdirectories on these drives, as not having done so may be the source of your problems, if the variable is set, but the subdirectory specified in the environment variable does not exist.

David Reich, a contributing editor to OS/2 Magazine and author of Designing OS/2 Applications, has been with the OS/2 development team since 1987. David is interested in your questions and suggestions. Contact him at CompuServe 76711,632 or Internet speedracer@vnet.ibm.com.

PCMCIA drivers, Extended Attributes, Novell and More...

WHAT YOU PLUG INTO AND PULL OUT OF YOUR MACHINE BY DAVID REICH

PCMCIA

Q: PCMCIA confuses me; all I know about it is that it allows the use of credit-card sized adapters. Can OS/2 use PCMCIA cards?

A: OS/2 has PCMCIA support built in. However, you should understand some aspects of PCMCIA before jumping in.

PCMCIA is the new emerging standard for laptop computers that use internal adapters, such as modems and network cards. These cards are the credit-card sized adapters you mentioned. The way this standard is implemented requires that you understand how the device drivers are layered, and where each one comes from. Then you can see what OS/2 supplies and how to use it.

PCMCIA support is structured in three layers. At the base, or computer-system level is Socket Services. Support for this feature is provided by the computer manufacturer. Each manufacturer of a PCMCIA-enabled computer must supply Socket Services specific to that computer.

The next piece is Card Services. Support for this feature is provided by the operating system—in this case, OS/2. The file name is *pcmcia.sys*. When you installed OS/2 (assuming you asked for PCMCIA support), it installed Card Services.

PCMCIA is the new emerging standard for laptop computers that use internal adapters

The final piece of the PCMCIA puzzle is the card driver. These drivers are specific to each PCMCIA card. For example, you cannot use the card driver from one PCMCIA modem card with a different manufacturer's card.

Now that you have the PCMCIA basics down, you might be wondering how all this fits with OS/2. When you install OS/2, if you plan to use PCMCIA cards (you actually could do this later, through Selective Install), select the item on the install window for PCMCIA support. This action will place the file *pcmcia.sys* on your hard disk and add the appropriate line into *config.sys*. Now the Card Services from OS/2 are installed.

The next step is installing the Socket Services. Even though this code is supplied by the computer manufacturer, you can't install it before OS/2 (where would you put the device driver statements?). To continue, you will need to find the Socket Services drivers that came

with your computer and use the installation program to copy the files and have the appropriate statements placed in *config.sys*, if necessary.

Now that you have installed Socket and Card Services, the final step is installing the card driver. Again, installation is manufacturer-dependent. Some cards, such as the IBM PCMCIA Token Ring Adapter, have an installation program that copies the file(s) and updates *config.sys* appropriately. Others may only have a set of instructions. You should note that for the card driver to work under OS/2 it must be OS/2-specific. Most PCMCIA card manufacturers ship the DOS card driver with the card. Some may also include the OS/2 driver. Be aware that in some cases you may need to contact the manufacturer to get the OS/2 version of the card driver.

OS/2 can, in fact, use PCMCIA cards. Installation of the layers of drivers can be a little intimidating, but it really is no different under OS/2 than it is under DOS.

PCMCIA PROBLEMS

Q: I've followed all of the instructions for installing PCMCIA drivers, but I can't get my modem to work. Do you have any suggestions?

Tips & Tricks cont'd on p. 76

The Future of Business Computing is Here Today!

Introducing

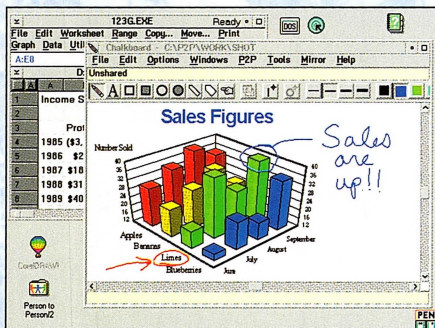
PenDirect™ for OS/2™

WORK MORE PRODUCTIVELY — Direct on-screen input means quicker and easier interaction with your computer. PenDirect is the most advanced light pen solution available today for OS/2.

WORK FASTER — PenDirect for OS/2 is *very* fast. Click, point, drag and draw with greater speed and precision than you can get from any other pointing device, plus a light pen won't fight with you for desk space. And with PenDirect's easy-to-install hardware (ISA, MCA or optional external) and solid award-winning software, you'll be up and running in just minutes.

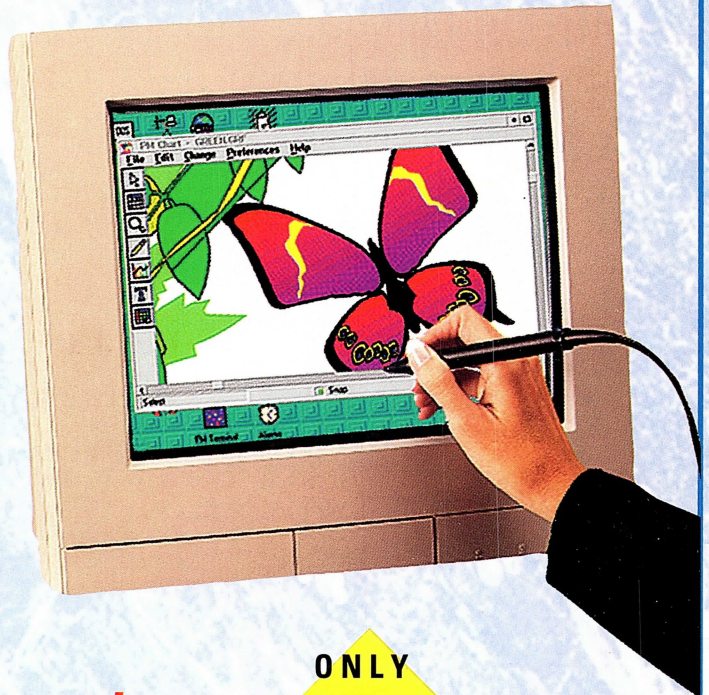
WORK SMARTER — PenDirect works great with all of your OS/2 software. Enhance graphics programs and bring desktop conferencing to life. Effortlessly navigate large spreadsheets, and get real light pen support for your 3270 apps. PenDirect fully supports all OS/2 2.x, Windows and DOS apps — at any screen resolution. Everything you need is included, no special monitor is required, and PenDirect lets you continue to use your mouse.

WORK IN COMFORT — PenDirect's one-to-one cursor interaction means long-term computer use that's simple and effortless. The pen's precise and quick input maximizes cursor control to eliminate "mouse dyslexia." You'll find your natural hand/eye coordination beats fumbling with an awkward mouse any day. Light pens also eliminate the tedious wrist movements associated with mice that cause fatigue and repetitive strain injuries.



Bring pen computing functionality to desktop conferencing software, like IBM's Person to Person.

WORK SAFER — PenDirect for OS/2 comes from FTG Data Systems, recognized as the world leader in light pen technology for PCs. FTG sells reliable American-made products backed with the best warranty in the industry, outstanding toll-free customer support and an unconditional no-risk, no-hassle evaluation/return policy. With over 100,000 pens installed, FTG is your safe choice and your best choice.



ONLY
\$298

limited-time introductory offer
(regularly \$398)

For a free 30-day evaluation unit,
or more information, call:

800-962-3900

714-995-3900 • FAX 714-995-3989

**FTG DATA
SYSTEMS**

8381 Katella Avenue
Stanton, California 90680

See us at PC EXPO

June 28 – 30 • Booth #760 • New York City

30 day
FREE TRIAL EVALUATION

© 1994 FTG Data Systems. All rights reserved. Screen shot courtesy of Micrografix, Inc. Image created using PM Chart v1.1.

PenDirect is a trademark of FTG Data Systems. OS/2 is a trademark of International Business Machines. All other trademarks are property of their respective owners.

Maybe You Can't Be In Six Places At Once...

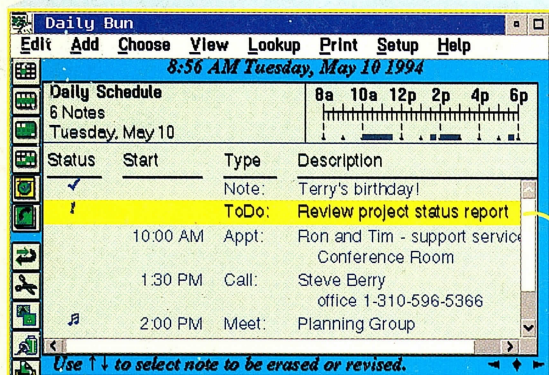
*Relish®
Version 2.2 Spreads
Easier than Ever*

But now your
• Calendar,
• Phone Book,
• To Do List,
and other personal
information can



Amazing Relish 2.2 Hot Buns

They're not files, not folders, not programs.
They're a new kind of Workplace Shell object
for dynamically viewing Relish information.



Personal information where you need it,
when you need it, always up-to-date,
always consistent — a sure way to
Relish every moment of your day!

Only Relish 2.2 Gives You All This

- * NEW! Iconbar for one-click access to your preferred functions
- * NEW! Type-to-search lets you "just start typing" to find things fast
- * NEW! Floating entries (without times or dates) appear on current date
- * Entries can span any length of time from a few minutes to many days
- * Intelligent time and date recognition gives you quick keyboard entry
- * Alarms can be scheduled as far ahead of an event as you want
- * Quick-access reference calendar can remain on the desktop
- * Reminders are automatic; so is schedule synchronization on a LAN
- * The most extensive drag-and-drop support of any OS/2 program

Here's how they work...

Buns give you views of your
information when and where you
need it. Use them just as you would
Relish - or customize them to match your needs.

Aesthetically, change colors, fonts, window sizes and positions
to fit your taste. And, there's a whole lot more.

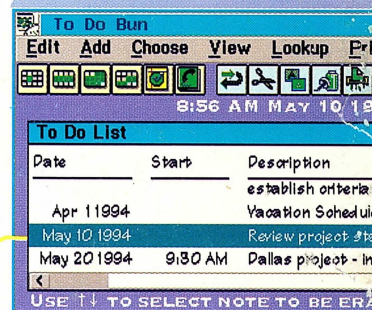
*Every bun can be copied and modified to present different
collections of information.*

Think of the possibilities.

One bun can show what To Do
items remain for that important
project. Another can have your
meetings with Fred. Others for
each category within your phone book. Put them in folders, on your
desktop, anywhere you need them.

When you want just those project-related To Dos, open that bun
and there they are. Need a printed copy? Just drag your bun right
to a printer without even opening it.

Best of all, everything is always up to
date. If you make a change through your
complete To Do list, or put another
project To Do on your calendar, your
customized bun is automatically and
instantly updated, right before your eyes!



Call 310•596•5121

**Sundial Systems
Corporation**

909 Electric Ave, Suite 204,
Seal Beach, CA 90740 USA

Relish

NEW Version 2.2 — one part of Sundial System's
"Personal Information Object" strategy for giving you
access to information like you've never had it before.